



CENSUS OF INDIA, 1951

VOLUME I

I N D I A

PART I-A — REPORT*

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OF THE INDIAN CIVIL SERVICE,
Registrar General, India and ex-officio Census Commissioner for India

Price

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FEW PEOPLE OUTSIDE realise that census is an administrative operation of great dimensions and, in addition, it is a scientific process. Indian census, in particular, covers the largest population in the world and it is also one of the most economical administrative operations. Census as an institution goes back to the remote past, but it is no longer a mere counting of heads; it involves extraction of information which plays a vital role in the determination of many of our administrative policies. The facts elicited during the course of this operation yield valuable scientific data of sociological importance. In many matters it provides a useful guide for the effectiveness or otherwise of our economic policies. The theory of population is in itself an interesting part of economics. The census helps us to test and adapt that theory to facts.

— Sardar VALLABHBHAI PATEL



No. 51/59/53-RG

THE REGISTRAR GENERAL, INDIA

New Delhi, the 1st August, 1953

From

Shri R.A. Gopalaswami, I.C.S.,
Registrar General, India ; and
ex-officio Census Commissioner for India

To

The Secretary to the Government of India,
Ministry of Home Affairs,
New Delhi

Sir.

I have the honour to submit herewith my report on the 1951 Census.

Yours faithfully,

R. A. GOPALASWAMI.

Registrar General, India ; and
ex-officio Census Commissioner for India

INTRODUCTION

1. The 1951 Census Reports— The reports on the 1951 Census are issued in 17 volumes, which are divided into 63 parts. The first of these volumes contains the All-India Census Report. It is divided into five parts entitled :

PART I-A—REPORT;

PART I-B—APPENDICES TO THE REPORT;

PART II-A—DEMOGRAPHIC TABLES;

PART II-B—ECONOMIC TABLES (General Population);

PART II-C—ECONOMIC TABLES (Rural and Urban Population).

The other volumes which are divided into 58 parts, contain the State Census Reports. These are prepared by my colleagues—the Superintendents of Census Operations—in different states as shown below* :

<i>Name of Superintendent</i>	<i>Volume number</i>	<i>Number of parts</i>	<i>Name of state(s)</i>
Shri RAJESHWARI PRASAD, I A.S.	II	5	Uttar Pradesh
Shri S. VENKATESWARAN, I C.S.	III	3	Madras and Coorg
Mr J. B. BOWMAN, I C.S.	IV	3	Bombay, Saurashtra and Kutch
Shri RANCHOR PRASAD, I A.S.	V	3	Bihar
Shri ASOK MITRA, I C.S.	VI	6	West Bengal and Sikkim

* All reports except the following have been or are being published :

(f) The following parts of reports are in the press :

BOMBAY	PART I	Report and Subsidiary Tables
	PART II-A	Demographic, Social and Cultural Tables
WEST BENGAL	PART I-C	Subsidiary Tables
	PARTS III and IV	Calcutta Report and Tables
HYDERABAD	PART I-B	Subsidiary Tables
	PART II-B	Economic, Household & Age (Sample) Tables
RAJASTHAN	PART I-A	Report
	PART I-B	Subsidiary Tables
ORISSA	PART I	Report and Subsidiary Tables
ASSAM	PART I-A	Report
	PART I-B	Subsidiary Tables
	PART II-A and II-B	Tables
TRAVANCORE-COCHIN	PART I-A	Report
	PART I-B	Subsidiary Tables
	PART II	Tables

[Footnote continued

Shri J D KERAWALLA, I A S (Died on 7-10-1952)	VII	6	Madhya Pradesh
Shri LAKSHMI CHANDRA VASHISHTA, of Punjab Civil Service	VIII	4	Punjab, PEPSU, Delhi, Himachal Pradesh and Bilaspur
Shri C K. MURTHY, I A S.	IX	4	Hyderabad
Shri YAMUNA LAL DASHORA	X	5	Rajasthan and Ajmer
Shri M AHMED, of Orissa Civil Service	XI	3	Orissa
Shri R. B. VAGHAIWALLA, I C S.	XII	4	Assam, Manipur and Tripura
Dr U. S. NAIR	XIII	3	Travancore- Cochin
Shri J B. MALLARADHYA, I.A.S.	XIV	2	Mysore
Shri RANGAL	XV	4	Madhya Bharat and Bhopal
Shri N K. DUBE	XVI	2	Vindhya Pradesh
Shri A. K. GHOSH, I.C.S.	XVII	1	Andaman and Nicobar Islands

2. District Census Handbooks—In addition to the All-India Census Report and the State Census Reports, 307 District Census Handbooks have been compiled by my colleagues. Each handbook relates to one district

Footnote concluded]

MYSORE	PART II	Tables
MADHYA BHARAT	PART I-B PARTS II-A and II-B	Subsidiary Tables Tables
VINDHYA PRADESH	PART I PART II	Report and Subsidiary Tables Tables

(ii) The following parts of reports are under preparation or nearing completion

UTTAR PRADESH	PART I-A	Report
BIHAR	PART I	Report and Subsidiary Tables
HYDERABAD	PART I-A	Report
MYSORE	PART I	Report and Subsidiary Tables
MADHYA BHARAT	PART I-A	Report
ANDAMAN AND NICOBAR ISLANDS		Report and Tables

separately and contains all the 1951 Census statistics relating to different local areas within the district as well as the basic totals of population (by eight separate livelihood classes) for every village and every ward of every town in the district. The handbooks (which are issued as State Government publications) also include other items of information relating to the districts which could be readily assembled and seemed likely to be useful for purposes of reference. One hundred and twelve District Census Handbooks have been published already and the others are in the press.

3. **Census of India brochures**—It will be noted that the statistical information contained in the All-India Census Report is limited to demographic and economic data relating to the country as a whole. Other types of data are published separately in a series of brochures. These are self-contained papers, which present the relevant statistics with the minimum of introductory information required for their proper understanding and use. This series of brochures also includes a summary of demographic and economic data which it was found necessary to make available to the public in advance of the main report, as well as some which are of a specialised nature.

The following brochures have been published already :

- (i) Final Population Totals;
- (ii) Population Zones, Natural Regions, Sub-Regions and Divisions;
- (iii) Sample Verification of the 1951 Census Count;
- (iv) Religion;
- (v) Summary of Demographic and Economic Data; and
- (vi) Special Groups.

The following brochures are in the press :

- (i) Maternity Data;
- (ii) Languages;
- (iii) Displaced Persons;
- (iv) Age Tables;
- (v) Life Tables;
- (vi) Literacy and Educational Standards; and
- (vii) Subsidiary Tables.

4. **Cost**—These are the end-products of the 1951 Census. The total cost involved cannot be stated exactly until after next year. But as most of the expenditure is known, the total can be estimated fairly closely. It is reckoned that the Central Government will have spent 149 lakhs of rupees in all on the 1951

Census. This works out to a sum of Rs 41/12 per 1,000 persons enumerated. The corresponding rate for the 1931 Census (the last census for which full tabulation was undertaken) was Rs 15/8. The rise in the unit cost is smaller than the increase which has occurred in the general level of prices, wages and salaries since 1931.

5. Preparation—The system of census-taking in India is somewhat unusual. It used to be likened in the past to the phoenix—the only bird of its kind which is reputed to complete its life-cycle by burning itself on the funeral pile and then to rise from the ashes with renewed youth to live through another cycle. Mr. M. W. M. YEARTS described it in somewhat less complimentary terms as follows :

“The system, if that word can be used here, is in brief that every 10 years, some officer is appointed to conduct a census and officers to work under him are appointed in each province. The States take corresponding action. These appointments are made at the minimum of time beforehand and within one year questionnaires have to be settled, the whole country divided into enumeration units, a hierarchy of enumeration officers created and trained, millions of schedules or slips printed and distributed over the face of the country, the whole process of enumeration carried out and checked, tabulation then carried out in offices located in any old place that can be found, on make-shift pigeon-holes and furniture and with temporary staffs, rushed through the presses—and then, in the third year the whole system is wound up, the officers and the office staffs are dispersed and India makes haste to discard and forget as soon as possible all the experience so painfully brought together.”

Shortly after the transfer of power, Government decided to put an end to this reproach. The action taken by Government was described in the following terms by the late Sardar VALLABHBHAI PATIL, then Home Minister, when he inaugurated the first Census Conference :

“Ever since I assumed charge of the Home Ministry, I have been taking some interest in census matters and I was really very happy to have been instrumental in placing on the Statute Book a permanent enactment dealing with the whole operation of Census.

“Hitherto, the Census used to be looked upon as a decennial operation for which haphazard temporary arrangements used to be made. I have already stated that there is now a permanent Census Act on the Statute Book and Government have already a permanent office of the Registrar General and Census Commissioner. It is our

intention through this unified organisation to effect continuous improvement over the whole field of population data including the Census and vital statistics and to conduct experiments in sampling which would reduce not only the elaboration of these operations but also the cost."

Mr. YEATTS, who had taken part in the 1931 Census as the Superintendent of Census Operations in Madras and directed the 1941 Census as Census Commissioner for India, was appointed Registrar General and *ex-officio* Census Commissioner. Thanks to these arrangements, it was possible to begin advance planning for the 1951 Census somewhat earlier than at former censuses. A provisional questionnaire was drawn up ; printing of census slips was taken in hand ; a general outline of the scheme of operations was drawn up ; and the officers were selected and earmarked for appointment as state census superintendents. Then, Mr. YEATTS fell ill and went on leave. I took charge of the census preparations in November 1949 as a temporary leave arrangement, in addition to my other duties in the Ministry of Home Affairs. Unfortunately, Mr. YEATTS died in August 1950, when his responsibility devolved on me entirely.

A definite stage in the preparatory period was reached during the last week of February 1950, when the newly appointed state census superintendents met in conference. We discussed the work before us in all aspects and achieved an agreed understanding of our tasks. Final orders of Government were obtained on the dates to be fixed for the census and on certain issues of policy affecting the scope of census enquiries. The questionnaire was finalised, as also a set of model all-India instructions. Detailed local instructions were prepared by my colleagues in all the local languages. Census charges were delimited in every district, divided into census circles and sub-divided into census blocks—the ultimate territorial unit for purposes of census enumeration. The census workers were selected and allotted to their respective charges, circles and blocks. They were supplied with forms and stationery, given oral as well as written instructions, practised and tested. During the first week of February 1951, when the preparatory phase ended, a temporary organisation consisting of about 7 lakhs of field workers was got ready for action. The exact numbers, according to reports received, were as follows : *5,93,518 census enumerators, grouped under the supervision and guidance of 80,006 census supervisors, themselves directed by 9,854 census charge officers.*

6. Enumeration—The nature of the work entrusted to the field workers is clearly described in a message which was sent to them on the eve of

enumeration by Shri C. RAJAGOPALACHARI, then Home Minister of the Government of India :

"Dear colleagues in the Census work! This is the first census held under orders of the Republic of free India. I am addressing the enumerators in particular. You have the privilege and honour of taking a hand in the first census of free India. Ten years hence the next census will be held. Yours is the earliest privilege. You are an enumerator and therefore you build the very base of the whole big structure. The base is, as you know, the most important part of any structure. The record of your work will remain carefully kept for use throughout the next ten years.

"Enumeration begins at sunrise on the 9th day of February. From then upto sunrise on the 1st March you will be visiting all the houses in your block, locating all the people for whose enumeration you are responsible ; and ascertaining and recording, in respect of all of them, the replies which are given to you for the prescribed census questions. On the 1st, 2nd and 3rd days of March you will re-visit all the houses for final check. You will then make sure that you have prepared the record of census enumeration in all respects as instructed, and hand it over to the supervisor.

"Yours is not an isolated local inquiry. You are one of about six hundred thousand patriots, all of whom will be engaged on an identical task at the same time. All of you are jointly responsible for enumerating all the people. Collectively you will prepare a record of basic facts relating to the life and livelihood of all the citizens and families in our Republic.

"If this record is to be correct and complete, the part which you contribute should, in itself, be correct and complete. You should master the simple instructions which you have received, and apply them uniformly and conscientiously. These instructions are based on a common plan for the country as a whole. Like a swarm of bees that build a beautiful hive according to the laws of geometry, each doing its part in obedience to a mystic urge, you should do your part according to conscience and the sense of truth inherent in us all.

IMPORTANT THINGS TO REMEMBER

"First,— EVERY PERSON SHOULD BE ENUMERATED ONCE, AND NOT MORE THAN ONCE. Most people would be enumerated at their usual

place of residence. There are a few who should be enumerated wherever they are found.

"*Secondly*,— Do not grudge the time and effort which will be necessary to get correct and complete answers to the questions relating to ECONOMIC STATUS AND MEANS OF LIVELIHOOD.

"I do hope you will take pride over the quality of your contribution to this nation-wide enterprise and do your best. GOD BLESS YOU!"

During the last 21 days of February 1951, 6 lakhs of census workers visited 644 lakhs of occupied houses and made enquiries. The information supplied to them by about 7 crores of citizens was recorded in 3,569 lakhs of census slips each of which was a dossier of one person. Then or later the more important items of the information contained in these dossiers were transcribed in the National Register of Citizens of which one part is allotted to every village and every ward of every town. The Register shows all the occupied houses and households arranged in numerical order; and against each household every line records the information relating to one member of the household.

The census slips and the National Register of Citizens were the record of basic information collected during the 1951 Census. We ascertained the following particulars in respect of every person who was enumerated:

- (i) Name, relationship to head of household, birth-place, sex, age and marital status;
- (ii) Household economic status, employment status (if any), principal means of livelihood and subsidiary means of livelihood (if any); and
- (iii) Nationality, religion, membership of 'special group' (if any), mother tongue, bilingualism (if any), literacy and educational standard, and particulars of displacement (for displaced persons only).

In addition to these items which were common to all parts of India one other item was prescribed in each state by the State Government concerned.

7. Tabulation— The second phase of census operations, *viz.*, enumeration ended with the second visit to all houses carried out during the first three days of March and the report by the field workers of the number counted by them. These reports were transmitted from the block, circle and charge, through the district administrative hierarchy, to state census superintendents and to me, and the 'Provisional Totals' based on them published during the second fortnight of April 1951 for districts, states and the country as a whole. The third phase commenced during April-May 1951, with the opening of 52 temporary tabulation

*This relates to Scheduled Castes, Scheduled Tribes, Anglo-Indians and certain classes treated provisionally as "backward" for purposes of the Census.

offices, sited at convenient centres in all parts of the country ; and the arrival at these offices of the census slips and National Register of Citizens together with abstracts and relevant information prepared by local officers.

The manner in which these offices were to be organised, workers recruited and trained, and the nature of the work to be performed in these offices had been planned in advance. The main principles were discussed and settled in a conference held during the last week of December 1950. Very detailed instructions designed to secure rigid uniformity of forms and procedures as well as safeguards against error had been settled and issued.

There were three stages in the working of these offices. The first was 'sorting and compilation' at the end of which, the numbers relating to each item of information were extracted from the census slips by sorters on what are called 'sorter's tickets' and then put together by compilers in 'posting statements' for the smaller territorial units within each district. This was the most important stage of tabulation. It was also the most expensive since the tabulation offices were at maximum strength while it was in progress. According to detailed information available about all the 52 offices except one (Hyderabad) for which figures are not available, 47,218 man-months were used up in this process of sorting and compilation. It took 10.4 sorter-months, 2.4 compiler-months and 1.1 supervisor-months to sort and compile the dossiers of one lakh of people†

The second stage of tabulation consists in processing the compilers' posting statements into the main census tables in the form prescribed for all states; the institution of arithmetical checks and counter-checks for avoidance of error ; and finally their scrutiny and independent check in a central tabulation office set up within my office. The final tables are then prepared for the press and go out as separate parts containing purely statistical material with brief introductions and explanations.

The third stage of tabulation consists in the preparation of what are called 'subsidiary tables' and constitutes statistical preparation for the next phase—viz, study and report. The aim at this stage is two-fold. One is to work out derivative data such as rates and percentages so as to institute comparison between the 1951 Census data and the corresponding data of previous censuses. The other is to work out the inter-connections between the census data and other important data (these are mainly vital statistics and cultivation statistics). Here

† In other countries, electrically operated machinery is used at this stage, thus rendering the employment of large staff unnecessary. A proposal that such machinery should be used at this census in order to carry out the work was considered carefully and decided against, on the ground that it would certainly increase the cost and, in all probability, take more time. Subsequent experience has not indicated any reason to regret that the work was done entirely on human agency.

again, identical forms and instructions were prescribed in advance. A special difficulty of a fairly formidable character was presented by the fact that the boundaries of India as well as of almost all states and a great many districts had undergone very extensive changes after the 15th August, 1947. All the relevant statistical data of earlier years had to be recomputed for the new territorial units ; and the manner in which this was done had to be clearly explained. The three stages mentioned above are applicable to the work done in the tabulation offices controlled by my colleagues. The second and third of these three stages were reproduced in the central tabulation office, where the all-India tables were prepared on the basis of state tables which had been checked in this office and approved for publication.

8. Study and Report—It has been a regular feature of all previous censuses (except that of 1941 when practically all tabulation except the basic population totals and community totals was dispensed with) that the census organisation did not content itself with the bare presentation of statistical data. The data were subjected to careful study and the results of the study were embodied in narrative reports of quite considerable length. Three broad purposes were sought to be served by such study :

First,— It was necessary to assess the value, in terms of completeness, reliability and comparability of the data procured and furnish such comments and explanations as would be helpful to users of census statistics. The officers who trained the field staff and scrutinised the basic record in the various stages of tabulation were in the best position to do this work ;

Secondly,— Much of the material collected at successive censuses is of an identical nature or at any rate relatable and comparable. A comparative study, with the help of the subsidiary tables already mentioned, helped to bring out evidence of changes in various characteristics which were usually important and significant either directly as matters of public interest or as the raw material for more specialised economic and social enquiries which might be undertaken by others ; and

Thirdly,— There are a great many topics of interest relating to the social and economic life of the people. Where the officers in charge of census operations were specially interested in any of them, they were in a position to collect and study the relevant data along with the routine study referred to above and the results were set out in the form of specialised discussion of such topics.

The Census Commissioner and the Superintendents are chosen primarily with reference to their intimate knowledge of the administrative machinery whose services are required to be mobilised as well as their capacity for general management of staff employed on governmental duties, rather than for any specialised knowledge or aptitude for making statistical computation or for carrying out economic and social research. The quality of the result achieved by their study was, therefore, of a varying nature. Almost all reports were characterised by their painstaking thoroughness, while the intellectual standard set by some reports was conspicuously high.

Careful consideration was given, on this occasion, to the question whether precedent should be followed at all or whether the census organisation might content itself with bare presentation of statistical material. The conclusion was reached that it was essential that the first and second of these three purposes should be secured as satisfactorily as possible within the time, and that the officers should exercise their discretion in respect of the third. In one respect, however, a departure from precedent was clearly stipulated from the outset. The 1951 Census was *not* to concern itself with questions regarding races, castes and tribes—except in so far as the necessary statistical material relating to ‘special groups’ was to be published and certain other material relating to backward classes collected and made over to the Backward Classes Commission. On the other hand, it was also enjoined that the maximum possible attention should be paid to economic data. The instructions which were issued to state census superintendents about the preparation of state census reports indicated the general structure required, and concluded with a statement of objective in the following terms :

“It does not matter if available material does not permit of analysis sufficiently definite for reaching conclusions. It does not also matter if the time available to reporting officers is insufficient for carrying out even such analysis as may be permitted by the material. What is essential is that the prescribed subsidiary tables should be correctly prepared and the reporting officers should apply their mind to these tables and attempt a review on the lines indicated. *The reports thus prepared will be of value mainly as the starting point of more detailed studies (to be undertaken subsequently) of the inter-relationships of population changes and economic changes in the country as a whole, as well as in the different states and natural divisions of the country. If this purpose is served, reporting officers will have discharged their duty.*”

All state census superintendents have been proceeding on these lines generally in preparing their reports. It should be emphasised here that the

views expressed in these reports written by different officers are of a purely personal nature. They should not be regarded as committing Government in any manner to any particular expression of opinion on controversial issues of any kind.

While the study of census data organised on the lines above described was proceeding, public interest in the population problem was increasing rapidly. The Planning Commission took cognisance of the subject and initiated group discussions in which I also took part. The report of the Planning Commission embodies specific proposals and visualises the collection of data bearing on the problem, partly as the basis for action by Government and partly as material for consideration by a Commission, the setting up of which is mentioned as a possibility.

In these circumstances, I felt that an all-India report on the 1951 Census would be materially incomplete, if it failed to deal adequately with the population problem of the country. I have accordingly set out a clear and full statement of my own personal appreciation of the problem and what I conceive to be the correct solution. *As explained already the views expressed in the report are of a purely personal nature and should not be understood to commit Government in any manner whatsoever.*

9. Arrangement of the All-India Report—The All-India Report, as already mentioned, is divided into five parts. Three of these parts (PARTS II-A, II-B and II-C) consist of statistical tables, accompanied by introductory notes which explain the manner in which the data were secured and the tables were compiled.

PART I-A is the narrative report proper and PART I-B consists of the APPENDICES. The report is divided into five chapters. The first three chapters present the picture as observed in 1951.

The first chapter, entitled "The Land and the People—1951" focusses attention on the area of land per head of population available in the country as a whole, describes how this varies in different parts of the country and how this variation is relatable to variations in topography, soil and rainfall. After dividing the country into 5 natural regions and 15 sub-regions in terms of these factors, a description is given of the salient facts of population and land use in three groups of sub-regions which are distinguished from one another as high, low and medium density sub-regions. Finally a comparison is instituted, with other countries of the world which leads to the conclusion not only that there is a very notable shortage of 'land area per capita' in our country but that the utilisation of usable land within the

on registered birth rates and maternity. Statistics are furnished not only for India as a whole, but six broad zones (North India, East India, South India, West India, Central India and North-West India) ; and they are then compared with similar rates of other countries. The information presented in the last section of this chapter entitled 'Maternity Pattern' is even more important. Thanks to the wise use made by certain State Governments of the 'local option' given to them to put one question of their choice, very valuable data have been secured about the average number of children born to mothers of different age-groups. Careful analysis of the data thus secured has yielded, for the first time, a clear picture of the pattern of maternity in this country and permits a comparison with the corresponding pattern in other countries. These statistics have led me to a new form of presentation of the solution for the population problem which, I believe, offers definite practical advantages. These are explained in the last chapter.

The third chapter entitled "Livelihood Pattern—1951" begins with the 'India Picture'. It contains a complete accounting of how the people obtain their means of livelihood. The next section explains how the pattern varies from one zone to another. The last section brings out the main

features of contrast between the pattern in India and the pattern in Great Britain and the United States of America. The account given in this chapter is furnished in as simple terms as possible; but serious students are sure to have very exacting standards of precision in respect of definitions and classifications. In order to meet their needs, a systematic review of a more formal nature has been prepared and included in the report as APPENDIX III (*Review of Census Economic Data*). In this review a full account is given of the pitfalls to be avoided in instituting comparison of the data between one part of the country and another for the same census, and between two different censuses for the same territory, and the limitations subject to which it is possible to draw significant conclusions.

The fourth chapter is headed "Before and Since 1921". This, like the three previous chapters, is strictly factual; but it lays the foundation on which the assessment of the population problem presented in the last chapter is subsequently erected. It is a fundamental conclusion of the study—of which the results are set out in this report—that 1921 is the 'Great Divide'. Our pattern of growth subsequent to that year is entirely unlike the pattern of growth before that year. The fact that there is a sharp contrast is first established by a detailed analysis of the relevant figures of all parts of India. Then the reasons which account for that fact are established by documentary evidence. The growth of population had been checked by famine and pestilence repeatedly before 1921. Except for one tragic exception, population grew unchecked after 1921. APPENDIX IV (*Famine and Pestilence*), which contains relevant extracts from old reports, furnishes in detail the evidence which is summarised in the first section of this chapter. The next section is devoted to showing that 1921 is the 'Great Divide' in another respect—before 1921, cultivation had more than kept pace with the growth of population, after 1921, cultivation was lagging far behind while the population total was forging ahead. Developing the conception of 'land area *per capita*', we have the area of cultivated land *per capita*, and based on it, of productivity of cultivation *per capita*. This had been stationary or moving up before 1921; after 1921, it was falling steeply. The value of the material presented in this section consists in this. great care has been taken to sift available data about cultivation, locate the areas for which statistics of high quality are available on a comparable basis over a long period and then work out the results for these areas. The third section sets out the results of the comparative study contained in APPENDIX III and explains how the livelihood pattern has been changing in response to unchecked growth of population and the decline of cultivation *per capita*. The economic strength of the average household is seen to have weakened. The last section of this chapter brings out the final and most important aspect of the 'Great Divide'. Notwithstanding the famines of the last

century, India used to be surplus in food. Round about 1921, India developed a shortage of foodgrains and this shortage has been growing ever since—slowly but steadily. The relevant statistics have been brought together from different sources and they bring out unmistakably how the change came about over a series of years. The change-over is dealt with in different aspects. First, there are the statistics of imports and exports of grains already referred to. Then, there are the statistics of grain prices (for which, thanks to the completeness of information available with the Government of Madras, we can form a good picture for the last 150 years and institute an illuminating comparison with the trend of grain prices in the United States of America). Finally, there is the profound change in the whole conception of the responsibilities of the State in respect of the supply and distribution of grains, the breakdown of free trade, the Bengal Famine, and the development of 'state trading system' on which crores of our people depend to-day. The evidence in support of material conclusions in the analysis made in this section is presented fully in APPENDIX V (*Shortage of Foodgrains*).

The last chapter entitled "*The Prospect—1981*" poses the question—what will be the pattern of our growth during the next thirty years? We know whither the current on which we have been drifting since 1921 is taking us. We also know of the great attempts now being made to stop this dangerous drift and steer the ship of State to safety. How strong is the current? And how strong are these attempts? How is a favourable outcome to be assured? These questions are discussed at length and firm conclusions reached. Much of the evidence in support of material conclusions of the analysis in this chapter is set out in APPENDIX VI (*Old Irrigation Projects and Irrigation Development Projects*) and APPENDIX VII (*Maternity Data and Birth Control*). It is fully realised and made clear at every stage of the discussion that the nature of the material is such that widely varying views can be and are being held both in respect of the facts themselves and the appreciation of the significance of the facts. As the Royal Commission in the United Kingdom observed "parts of the subject may be likened to that fabled morass where armies whole have sunk". The various views held on the subject are set out and reasons given for reaching a particular conclusion. The busy reader may, at this stage, turn over to the last section of the last chapter and read the conclusion straightaway.

10. Acknowledgements—Though the CONSTITUTION lays the duty of census-taking exclusively on the Central Government the census is carried out for the benefit of the entire State which, according to the CONSTITUTION "includes the Government and Parliament of India and the Government and the Legislature of each of the States and all local or other authorities

within the territory of India or under the control of the Government of India". It gives me great pleasure to report that this was fully realised ; and the census received unstinted support and ready assistance from the Governments of all states as well as all other authorities.

This census, like its predecessors, was made possible by the efforts of about six lakhs of public-spirited census workers who made the enquiries and the seven crores or so of citizens who gave them the information asked for. The fact that this is the first census of free India was appreciated by all and it contributed greatly to the success of the undertaking. The press throughout the country, as I have gratefully acknowledged once before, was consistently helpful and gave effective publicity and support to the census at all important stages.

The results of the labours of my colleagues will be before the public. Where all have given of their best, it would be invidious to name any one for special mention. I should, however, place on record my tribute of admiration for Shri J. D. KERAWALLA whose enthusiasm for the work was infectious and whose untiring exertions may have contributed to the malady of which he died before his report could be published.

A number of officers helped me to direct the census and write this report. Shri D. NATARAJAN who was on Mr. YEATTS' staff both in 1931 and 1941 has not only contributed his personal knowledge of prior censuses but also borne a heavy burden of administrative responsibility as Assistant Census Commissioner. Without his help I could not have held charge of two distinct offices. I have also benefitted by Shri NATARAJAN's advice and suggestions in drafting my report. Shri P. N. KAUL had no previous experience of government offices when he was called upon to function as the statistical conscience-keeper not only for me but all the state census superintendents. He did this to the satisfaction of all of us. He organised the central tabulation office, trained and led a temporary staff which constructed all the all-India tables and checked all the state census tables. Shri T. V. RANGARAJAN and Shri SHANKAR KAPOOR rendered notable assistance, in the collection and analysis of material for my use, as well as in checking the drafts and preparing them for the press. All the members of this able team, and the other members of the staff have worked long hours over a long period ungrudgingly and have still got much to do in seeing all this material through the press. This report is as much theirs as mine and I am very grateful to them.

I have drawn freely on the resources of other Ministries and Departments who have ungrudgingly offered all facilities. The Ministry of Labour spared the services of Shri S. P. JAIN who prepared the Age Tables and Life Tables,

and whose initial study of the statistics of registration of births and deaths in combination with census data was the starting point of the systematic analysis of demographic data furnished in this report. The Planning Commission spared the services of Dr. V. NATH who helped me to formulate the scheme of natural regions and sub-regions and to build up parts of the statistical material presented in APPENDICES I and VI, including in particular, the data relating to 'decline of cultivation *per capita*'. I valued his advice and suggestions based on his study of conditions in foreign countries as well as his knowledge of discussion and study within the Planning Commission. The Adviser of the Planning Commission on Health Programmes, Dr. T. LAKSHMINARAYANA spared time for many discussions which clarified the issues relating to birth control. His experienced judgment gave me confidence in putting forward definitive conclusions in a highly controversial field.

Much material was specially compiled for me by the Surveyor General of India ; the Director General of Observatories, Meteorological Department ; the Director of Geological Survey of India; the Inspector-General of Forests ; the Economic and Statistical Adviser, Ministry of Food and Agriculture ; the Statistical Adviser, Indian Council of Agricultural Research ; and the Head of the Division of Chemistry, Indian Agricultural Research Institute.

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Publicity arrangements for the census were in the hands of Shri V. KRISHNASWAMI of the Press Information Bureau, who took keen personal interest for which I am grateful.

In these days the pressure on the Government Press is extremely heavy and Shri C A SUBRAHMANYAM, Controller of Printing & Stationery, India has a very difficult task to perform. But the Census of India is an old customer and there has never been any doubt about the anxiety of all concerned in the Government Press to do their best to ensure that census printing is attended to efficiently and speedily. I have every confidence that the work that still remains to be done will be done well.

NEW DELHI :
1st August, 1953

R. A. GOPALASWAMI,
Registrar General, India ; and
ex-officio Census Commissioner for India.

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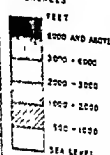
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Natural Regions and Sub-Regions

INDIA

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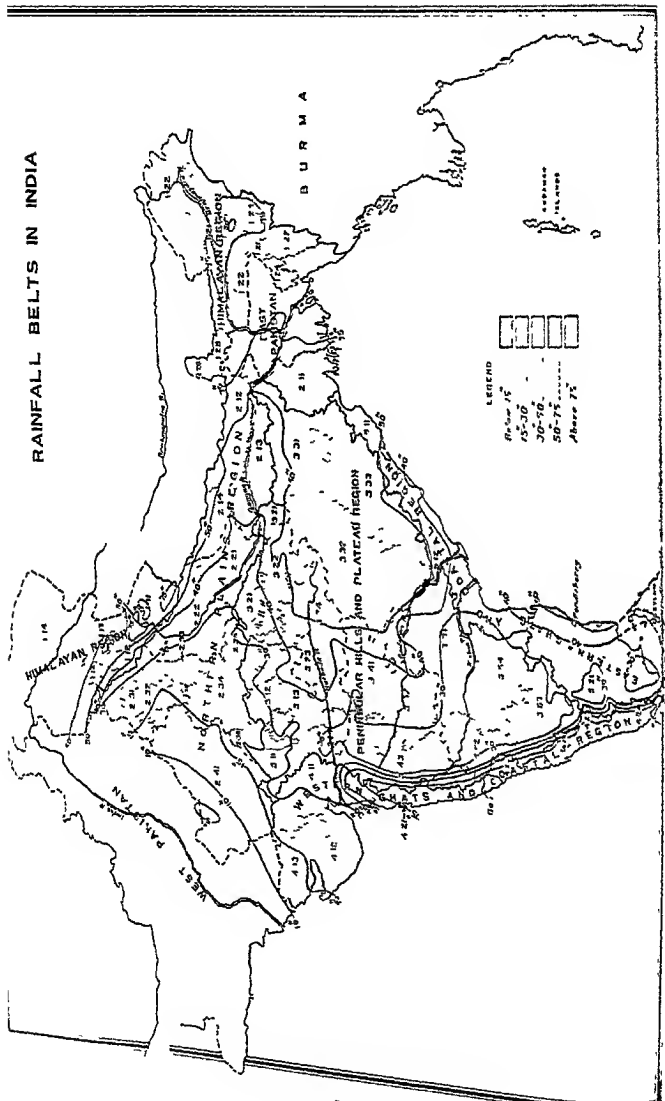
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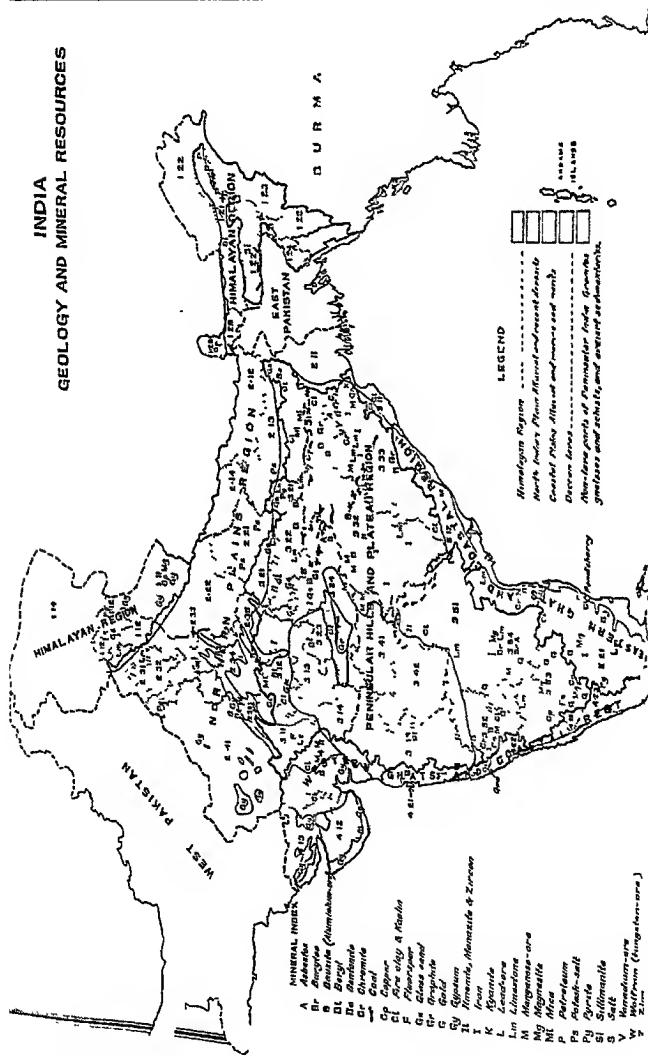
Rainfall Belts

RAINFALL BELTS IN INDIA



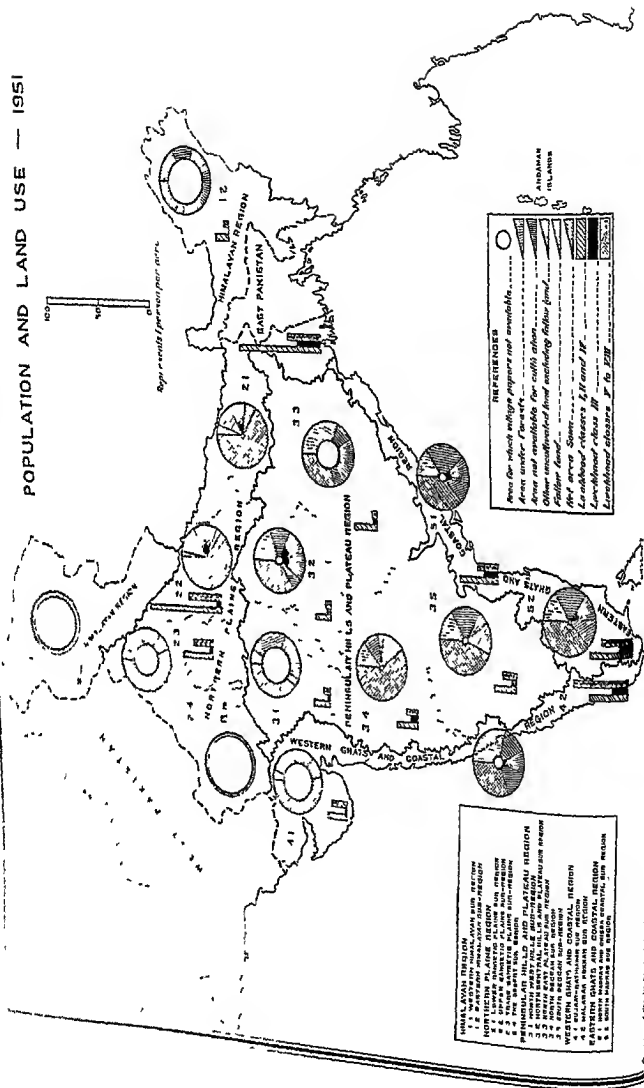
Geology and Mineral Resources

INDIA GEOLOGY AND MINERAL RESOURCES



Population and Land Use — 1951

POPULATION AND LAND USE — 1951



CHAPTER I

The Land and the People—1951

"We, the People of India"

"WE, THE PEOPLE OF INDIA, having solemnly resolved to constitute India into a **SOVEREIGN DEMOCRATIC REPUBLIC** and to secure to all its citizens :

JUSTICE, social, economic and political ;

LIBERTY of thought, expression, belief, faith and worship ;

EQUALITY of status and of opportunity ; and to promote among them all

FRATERNITY assuring the dignity of the individual and the unity of the Nation ;

IN OUR CONSTITUENT ASSEMBLY this twenty-sixth day of November, 1949, do **HEREBY ADOPT, ENACT AND GIVE TO OURSELVES THIS CONSTITUTION**".

Thus the preamble of the CONSTITUTION OF INDIA, which came into force on the 26th day of January, 1950.

2. How many are "WE, THE PEOPLE OF INDIA"? In what places do WE live? In what manner do WE obtain our means of living? At what rate have WE been growing in number during the last few decades? What has been the effect of this growth upon our means of living? What is the inference to be drawn from the experience of the last few decades about the probable growth of our numbers and our means of living during the next few decades?

We need answers to these questions. We need them, not because of idle curiosity, but in order to help us achieve the high purposes enshrined in our CONSTITUTION.

A — Land Area *per capita*

THIS REPORT cannot be easy reading. It is loaded with figures, and figures are wearisome. It is all the more necessary, therefore, that attention should be drawn, at the outset, to two figures which are of fundamental importance. They are :

First,—‘81 crores of acres’ This is the total area of our land.

Secondly,—‘36 crores of people’. This was the population of the Indian Union at some point of time between the 26th January, 1950 when the Indian Union was born and the 1st March, 1951, the reference date of the Census.

4. Can these figures be relied on as correct ? Yes. There is no room for reasonable doubt on the point. The first figure—81 crores of acres—and indeed all figures of land area which are borne on the books of the Survey of India, are perhaps the most accurate among the national statistics of India (or, for that matter, of any country in the world) They are based on exact measurements, scientifically designed and carried out by a highly trained professional agency over a long series of years.

5. The 1951 Census count yielded a total of 356,879,394 as the number present at sunrise on the 1st March, 1951. May we take it that the count was correct—if not to the last integer—at least to the nearest lakh ? May we take it as certain that the number was 3,569 lakhs ? No. That would be rating the completeness of the census count too high.

We have indeed made the best possible effort to take a correct count. There are very good reasons to believe that the count must have been at least as close to the truth on this occasion as at any previous census in India. But until recently we had no knowledge about how close to the truth the census count used to be in the past. At this census, Government decided that a verification of the census count should be carried out under conditions designed to yield reliable information on this point.

The results of that operation have been published* already along with a detailed account of the manner in which the verification was carried out. The conclusion has been stated thus :

“For every thousand persons included in the census count 11 other persons were probably omitted. It is a reasonably safe conclusion that the number of persons omitted (per thousand counted) could not have exceeded 12 or fallen short of 10.”

* “Verification of the 1951 Census Count” Census of India Paper No. 1 of 1953.

6. From this it would follow that the actual number of people present (at sunrise of the 1st March, 1951) must have exceeded the published total by not less than 36 lakhs and not more than 43 lakhs. It is convenient to express the same result in another way. We may say that the published total of 35 crores and 69 lakhs represented the actual number of people present—not indeed on the 1st March 1951, the reference date of the Census, but on some other day a few months earlier. Our knowledge of the rate at which our numbers are growing in recent years (this will be explained in a later chapter) helps us to fix this earlier date within fairly narrow limits. It must have preceded the census day by not less than 10 months and not more than 12 months. On some day in March-April 1950—it is reasonably certain the census count of 35 crores and 69 lakhs represented the exact number of people present in the territory covered by the 1951 Census.

7. But the territory covered by the 1951 Census is not quite the same thing as the territory of India. There is a fringe of tribal territory in the north-east frontier (known as the *Part B Tribal Areas of Assam*) where the census has never been taken. A figure of about six lakhs of people has been mentioned as the probable number of people living there. Though little better than a guess, it indicates the order of magnitude which might be borne in mind.

When preparations for the 1951 Census were taken in hand, it became clear that a complete count was impossible in the conditions prevailing in the state of Jammu and Kashmir. Government decided that the information likely to be secured by an incomplete count was not worth the effort, expense and very considerable strain on administrative resources, which are necessarily involved in census-taking. Hence the entire state of Jammu and Kashmir had to be excluded from the census count. It is possible, however, from past census figures to make a fairly firm estimate of the population of Jammu and Kashmir. This may be taken to be about 44 lakhs.

It is reasonably safe on these facts to conclude : First,—*that the total number of people living in India had passed the 36-crore-mark well before the census day; and Secondly,—that it had not reached that figure on 26th January, 1950**.

8. Given the two basic figures—81 crores of acres and 36 crores of people—we may derive a third, namely,—‘2 $\frac{1}{4}$ acres’. This is our ‘land area per capita’.

Let us suppose that the entire territory of India is divided (with mathematical exactitude) equally among all the people living in India, we may each

*The title of this chapter—“The Land and the People—1951”—as well as all other statements made about the people (as enumerated at the 1951 Census) should therefore be regarded as referable, not to a specific point of time, but to the interval between the 26th January, 1950 and the 1st March 1951.

expect to get a square plot of land—measuring a little more than one hundred yards from north to south as well as from east to west.

That is the 'land area *per capita*' in India. Let us keep this plot of land firmly in mind—for we shall see, as we proceed, that the size of this plot, the manner in which it is used, and the changes which occur in it from one generation to another have a profound effect on our life and livelihood.

9. The CONSTITUTION defines the political divisions of the country as consisting of *Part A* states, *Part B* states, *Part C* states and *Part D* territories. These legal distinctions have no special significance in relation to the life of the people or their means of living. Consistently with the nature and purpose of this report, it would be appropriate for us to consider the states and territories in the order of their population.

Rather more than two-thirds of the people of India—24 crores and 25 lakhs—live in six states, in all of which the inhabitants number more than two crores. The six states are: Uttar Pradesh (632), Madras (570), Bihar (402), Bombay (360), West Bengal (248) and Madhya Pradesh (212) [The figures in brackets represent the number of people in each state, rounded to the nearest lakh.]

There are 8 other states, in all of which the inhabitants number between half-a-crore and two crores. These are: Hyderabad (187), Rajasthan (153), Orissa (146), Punjab (126), Travancore-Cochin (93), Mysore (91), Assam (90) and Madhya Bharat (80). The total number of people living in these states is 9 crores and 66 lakhs. There are 16 other political units all of whose inhabitants taken together, number only about 2 crores in all. These are the states of Jammu and Kashmir (41), Saurashtra (41), Vindhya Pradesh (36), Patiala and East Punjab States Union (35), Delhi (17), Himachal Pradesh (10), Bhopal (8), Ajmer (7), Tripura (6), Manipur (6), Kutch (6), Coorg (2), Sikkim (1), Bilaspur (1), and finally two other territories with less than half-a-lakh each, *viz.*, Chandernagore and the Andaman and Nicobar Islands.

10. Full information about each of these units, with detailed reference to district data will be found in the reports written by state census superintendents. It is, therefore, not necessary that all of them should be individually referred to and discussed in this report. It is also not useful to do so because these 32 units vary so largely among themselves, both in size of population and extent of territory, that if we tried to look at all of them at once, we should miss the wood for the trees and get lost in a parade of local peculiarities which may have no real significance in the all-India picture. That is why it

LAND AREA PER CAPITA

is necessary that some sort of grouping of geographically contiguous units should be made. Hence the six 'zones': North India, East India, South India, West India, Central India and North-West India.

Uttar Pradesh is so situated and has such a large population that it is convenient to treat it as a zone by itself. It is *North India*.

Bihar, Orissa, West Bengal, Assam, Manipur, Tripura, Sikkim and Chander-nagore are grouped together as *East India*.

South India consists of Madras, Mysore, Travancore-Cochin and Coorg.

Bombay, Saurashtra and Kutch make up *West India*.

Central India takes in Madhya Pradesh, Madhya Bharat, Hyderabad, Bhopal and Vindhya Pradesh.

Rajasthan, Punjab, Patiala and East Punjab States Union, Jammu and Kashmir, Ajmer, Delhi, Bilaspur and Himachal Pradesh make up *North-West India*.

[The total population of Andaman and Nicobar Islands is only 30,971; and the land area is 20·58 lakhs of acres. The figures relating to this territory are not included in any zone but are included in the India totals]

II. The table below shows for each zone the two basic figures—land area and population—and the derived figure of land area *per capita* :

TABLE I

Zone	Land area (IN LAKHS OF ACRES)	Population (IN LAKHS)	Land area per capita (IN ACRES)
North India	726	632	1·15
East India	1,675	901	1·86
South India	1,075	756	1·42
West India	957	407	2·35
Central India	1,852	523	3·54
North-West India	1,226	350	3·51
INDIA (excluding Jammu & Kashmir)	7,532	3,569	2·11
INDIA (including Jammu & Kashmir)	8,126	3,613	2·25

The table brings out clearly the simple fact that the people of India are *not* distributed among the different zones in any kind of orderly proportion to the land area.

B — *Topography, Soil and Rainfall*

IT IS CLEAR that the people living in some zones of India have got more land per head than their fellow-citizens in other zones. Does this mean that the former are much better off than the latter? Central India, for instance, provides 354 cents of land, which is more than three times as large as the land area *per capita* in North India—115 cents. Are the people of Madhya Pradesh, Hyderabad and Madhya Bharat three times as rich as those of Uttar Pradesh? Obviously, this cannot be. For all we know to the contrary, 115 cents of land in North India may provide even better living than 354 cents of land in Central India. Evidently, we should not attempt to draw conclusions of practical significance from the figures in TABLE 1, until we have gone some way towards understanding the differences between the different sorts of land there are in different parts of the country, and assessed the significance of those differences for purposes of growing food or otherwise providing a means of living out of the land.

Among the major factors which make a difference in this respect, the first is topography—the nature of the terrain or the land-form of the tracts in question.

13 Out of India's total land area of 81 crores and 26 lakhs of acres, 8 crores and 69 lakhs of acres (or 10·7 per cent) lie in mountains. The word 'mountain' is used in this context in a strict sense—it is limited to really steep land at a very high elevation and generally excludes all land below a limit of 7,000 feet above sea level. Nearly two-thirds of such mountain tracts (5 crores and 48 lakhs of acres) are found in Jammu and Kashmir. The remaining one-third is distributed in three zones as follows :

141 lakhs of acres in East India;

97 lakhs of acres in North-West India (*excluding* Jammu & Kashmir); and

79 lakhs of acres in North India.

Rather less than 5 lakhs of acres are to be found in South India. There are no mountains, in the strict sense of the term, in West India and Central India.

Mountains are impressive affairs—even inspiring—to people who live far away from them and go there for rest and recreation or occasional business. But they are of little use for settlement of people who wish to cultivate the land and grow food. In general the land is far too steep. It is extremely difficult to find (or make) plots of land on which food or other crops may be grown. Scholars who have made a special study of this subject estimate that

95 per cent of the superficial area of land in mountain tracts should be written off, from the point of view of practical farming.

14. The write-off is not so heavy when we turn to other kinds of tracts. It has been suggested that the appropriate ratios are 75 per cent in hilly tracts, 25 per cent in plateaus and perhaps as low as 5 per cent in the plains.

We may use the term 'hill' to cover all kinds of weathered highlands (except mountains) without reference to the level at which they are situated. The term would include practically the entire area of all ranges other than the Himalayan and also the foothills of the Himalayan range upto the limit already mentioned — about 7,000 feet above sea level.

Hilly tracts as thus defined comprise 15 crores and 9 lakhs of acres (or 18.6 per cent) of all land in India. They are distributed as follows :

525 lakhs of acres in East India;
333 lakhs of acres in Central India,
278 lakhs of acres in South India, and
198 lakhs of acres in West India.

There are 88 lakhs of acres in North-West India outside Jammu and Kashmir and there are 27 lakhs of acres in Jammu and Kashmir. There are 41 lakhs of acres in North India and 21 lakhs in Andaman and Nicobar Islands.

15. Plateaus may be defined, in the conditions of this country, as including all relatively flat tracts of land which lie between one thousand feet and three thousand feet above sea level. Such tracts measure 22 crores and 48 lakhs of acres, or 27.7 per cent of all land in India. Almost exactly one-half of all plateaus (11 crores and 25 lakhs of acres) is found in Central India. The remaining half is distributed as follows :

300 lakhs of acres in North-West India (*excluding* Jammu & Kashmir),
286 lakhs of acres in South India,
284 lakhs of acres in West India, and
204 lakhs of acres in East India.

A fringe of North India measuring 34 lakhs of acres is also plateau-land.

16. Finally, we may come down to the plains, of which we have 34 crores and 99 lakhs of acres—that is to say, 43.0 per cent of all land in India. The plains are distributed as follows :

805 lakhs of acres in East India;
742 lakhs of acres in North-West India,
572 lakhs of acres in North India,
506 lakhs of acres in South India,
476 lakhs of acres in West India; and
395 lakhs of acres in Central India

As a rule, these tracts are the best for purposes of cultivation and settlement of people. This is so not only because the amount of land which requires to be written off is relatively small, but the chances of finding fertile soil are better in the plains than in the plateaus where (as a rule and unlike the valleys in hilly tracts) fertile land is scarce.

17. This is not to say, however, that all the 35 crores of plain-land are fertile or even cultivable. Far from it. There are vast stretches of land in some parts of the country which can be called 'land' only in a technical sense. A notable instance of such 'land' is the Rann of Kutch, which measures as much as 59 lakhs of acres. Another type of such land is the stretch of sandy waste* in the Rajasthan Dry Area which measures about 2 crores and 54 lakhs of acres. The capacity of such land to support life is negligible. The sandy wastes and marshy land which occur in many plain tracts, as isolated patches, are one thing; continuous stretches of waste like those mentioned above are in a different category. In any realistic assessment of usable resources, it is necessary that they should be left out of the reckoning. We have got altogether 33 crores of acres of such land in North-West India and about three-quarters of a crore in West India.

18. We may now sum up the result of our review of the topography of the different zones from the point of view of distinguishing what may be called the 'topographically usable area' from other area not so usable. The relevant figures are shown in one view in the table below :

TABLE 2

Zone	(IN LAKHS OF ACRES)			
	Total land area	Topographical factors		Deduct unusable area
		Mountains	Hills Plateaux	Plains
				Topographically usable area

19. It is not to be supposed that all topographically usable area is cultivable. Even within this area, there are large extents of land which are little better than barren rock and have little or no soil cover. We should now consider the nature and extent of soil cover available for land in different parts of the country.

Unfortunately such information as we have been able to get together is mostly of a descriptive nature. There is next to no information of a quantitative character about the actual areas or productivity in terms of crop yields per acre of different types of soils. The following is a very brief summary of available information :

(i) Four main groups of soils are found extensively all over India.

Among them, the alluvial group is by far the most productive. They are distributed over practically the whole of the Gangetic plains in Uttar Pradesh, West Bengal and extend to the Punjab and parts of Assam and Orissa. The coastal tracts of southern India are also alluvial, especially at the mouths of the rivers, where they are known as deltaic alluvium. The soils are deficient in phosphoric acid, nitrogen and humus, but not generally in potash and lime. Interspersed within the alluvial group, are patches of saline and alkaline soils which contain varying amounts of soluble salts. Such type of soils are found in Uttar Pradesh ('*usar*' land), Bombay Deccan and a portion of North Bihar.

(ii) Then there are the black soils which are loamy to clayey in texture, vary in depth, and contain lime *kankar* in varying percentages, and free calcium carbonate. These soils are generally suitable for cultivation of cotton and are known in many places as 'black cotton soils' or '*regur*'. Resembling tropical black earth, they are very well-defined soils which occupy the greater part of Bombay and Saurashtra, western parts of Madhya Pradesh, Madhya Bharat, and Hyderabad and some parts of Madras including the districts of Tirunelveli and Ramanathapuram. The soils are fairly fertile and very useful for commercial crops. They are generally deficient in nitrogen, phosphoric acid and organic matter, but potash and lime are usually high.

(iii) Another fairly well-defined and extensive group consists of red soils. They differ widely in depth and fertility in different parts of India and are generally of medium to low fertility. They cover very large tracts of Madras, Mysore, south-east Bombay, east Hyderabad

and a strip of tract running along the eastern part of Madhya Pradesh to Chhota Nagpur and Orissa. In the north, the red soil area extends into and includes the greater part of the Santhal Parganas in Bihar, the Birbhum district of West Bengal, the Mirzapur, Jhansi and Hamirpur districts of Uttar Pradesh, northern portion of Madhya Bharat, the Aravallies and the eastern half of Rajasthan

- (iv) The last of the four main groups consists of laterite and lateritic soils. Soils of this group are derived by the atmospheric weathering of several types of rocks under monsoon conditions of alternating dry and wet periods. Well developed laterite and lateritic soils are found on the summits of hills of the Deccan, Madhya Bharat, Madhya Pradesh, and of the Rajmahal and Eastern Ghats, and certain parts of Orissa, Bombay, Malabar and Assam. The soils are deficient in potash, phosphoric acid and lime. On higher levels these soils are exceedingly thin and gravelly, but on lower levels and in the valleys they consist of heavy loams and clays. On the whole, these soils are poor.
- (v) Other miscellaneous types of soils include desert or arid soils occurring in the regions having low rainfall, *e.g.*, Ajmer, eastern Rajasthan etc. Marshy or peaty soils occur over small areas in Travancore, and in parts of West Bengal, Orissa and Madras. Hill soils, which are generally sandy or red loam occur in the hilly regions of West Bengal, Punjab and Assam

20 We cannot grow food unless we have topographically usable land with at least the minimum of useful soil. But land alone will not do; even if it is perfectly level and has the most fertile soil cover, it cannot be used to grow food or any other crops unless there is rain

The amount of rain that falls on Indian territory every year, and year after year, is something colossal. Let us consider an inch of rain falling on an acre of land. The water which thus collects disappears from view very quickly and one does not, therefore, appreciate the fact that the quantity is quite large—the weight of this water is no less than 2,800 maunds. On an average of good, bad and indifferent years, and taking into account all parts of the country, we get rather more than 42 inches of rain falling on every acre of land every year. That is to say, we get well over one lakh of maunds of water on every acre of land. We have noted already that there are 81 crores of acres. Those who feel curious about the total amount of our rain-water-supply may do the multiplication

sum for themselves! If only this enormous amount of rain fell evenly both in space and in time, the amount of food which is now grown on our land can be greatly increased. Unfortunately, nature distributes rain even more unevenly than soils. Some tracts get too much rain, many get too little. A great deal of rain falls in such places and at such times that it cannot be used to any good purpose.

21. One of the maps at the beginning of this chapter shows the division of the country into five 'rainfall belts' which have been named as follows :

<i>Rainfall belt</i>	<i>Annual rainfall</i>
Blue belt	Exceeding 75 inches ;
Dark green belt	Between 50 and 75 inches ;
Light green belt	Between 30 and 50 inches ;
Brown belt	Between 15 and 30 inches ;
Yellow belt	Below 15 inches

The blue belt and the dark green belt cover almost exactly a third of the country. They are well provided with enough rain, which is generally, though not invariably, also dependable.

The light green belt covers almost exactly another third of the country. Here the rainfall, if timely, is adequate; but the vagaries of the monsoon are apt to cause occasional failure of crops and consequent distress.

The brown belt and the yellow belt, taken together, cover the remaining third of the country. Here the seasonal fluctuations are so frequent, that they are more or less regularly expected ; and when they occur, they cause a great deal of hardship to the people and expense to Government. The yellow belt has so little rain that a great many people do not live there. The brown belt where one-fourth of our people live, is exposed to special hazards which are a permanent problem for the people and the Government.

22. If we are to make an intelligent study of why the people happen to be as unequally distributed as they are in different parts of our country, it is essential we should get behind the existing political divisions of the country into states and their grouping in zones. We should visualise the country as consisting of different parts which are distinguished from one another by differences of topography, soil, rainfall—the major factors which determine how much of 'land' can be used to grow food and the degree of its usefulness for the purpose. These, in turn, determine how many people could make a living on the land. From the point of view merely of topography, the country may be divided notionally into five broad 'regions', *viz.*, (1) the Himalayan region, (2) the Northern Plains region, (3) the Peninsular Hills and Plateau region, (4) the

CHAPTER I. THE LAND AND THE PEOPLE—1951

Western Ghats and Coastal Region, and (5) the Eastern Ghats and Coastal region. These regions, however, are very large units. Big differences occur within them because of differences in the amount of rainfall, as also to some extent because of variations in the soils. So, these regions have been divided into 15 'sub-regions' as shown below :

<i>Code No</i>	<i>Region</i>	<i>Code No</i>	<i>Sub-Region</i>
1	Himalayan . . .	{ 1 1	Western Himalayan
		{ 1 2	Eastern Himalayan
2	Northern Plains . . .	{ 2 1	Lower Gangetic Plains
		{ 2 2	Upper Gangetic Plains
		{ 2 3	Trans-Gangetic Plains
		{ 2 4	The Desert
3	Peninsular Hills and Plateau . . .	{ 3 1	North-West Hills
		{ 3 2	North Central Hills & Plateau
		{ 3 3	North-East Plateau
		{ 3 4	North Deccan
		{ 3 5	South Deccan
4	Western Ghats and Coastal . . .	{ 4 1	Gujarat-Kathiawar
		{ 4 2	Malabar-Konkan
5	Eastern Ghats and Coastal . . .	{ 5 1	North Madras & Orissa Coastal
		{ 5 2	South Madras

These sub-regions, in turn, have been divided into 'natural divisions' each of which is either an entire state or a group of contiguous districts within a state. The data collected at the 1951 Census have been tabulated for these natural divisions and it is hoped this will facilitate more intensive study and better understanding of the significance of our basic population data.

C — *High Density Sub-Regions*

APPROXIMATELY one-half of the people of India live on rather less than one-quarter of Indian land. The tracts in which they live comprise the five sub-regions specified in TABLE 3 on opposite page.

HIGH DENSITY SUB-REGIONS

TABLE 3

Name of sub-region	Population (IN LAKHS)	Density (NUMBER PER SQ. MILE)	Land area (IN LAKHS OF ACRES)	Land area per capita (IN CENTS)
Lower Gangetic Plains . .	700	832	538	77
Upper Gangetic Plains .	389	681	366	94
Malabar-Konkan . .	238	638	239	100
South Madras	307	554	355	115
North Madras & Orissa Coastal .	211	461	293	139
TOTAL 5 SUB-REGIONS	1,845	660	1,791	97

The sub-regions are arranged in order of density of settlement of the people on the land. We may examine what are the conditions of topography, soil and rainfall which enable the land to be used in such a way as to support much larger numbers in these sub-regions than elsewhere.

24. LOWER GANGETIC PLAINS—This sub-region includes the whole of West Bengal except three sub-Himalayan districts (Jalpaiguri, Darjeeling and Cooch-Behar) ; the whole of Bihar *except* Chhota Nagpur division ; and also Eastern Uttar Pradesh (that is to say, the districts of Banaras, Ghazipur, Ballia, Gorakhpur, Deoria, Azamgarh, Gonda and Bahraich) The total population is 700 lakhs. The land area is 538 lakhs of acres. In terms of India, the population percentage is 19·4 ; while the land area percentage is only 6·6 The land area *per capita* is 77 cents—against India's 225 In this sub-region, the range of variation is not very large. The land area *per capita* is 73 cents in West Bengal Plain, 76 cents in North Bihar Plain and 75 cents in East Uttar Pradesh Plain. It rises to 89 cents in South Bihar Plain which includes some hills and plateau tracts. The sub-region as a whole, is one large plain Out of the total of 77 cents *per capita*, 74 cents are plain-land. A small fringe of plateaus and hills accounts for the remaining 3 cents.

The soils are among the best in India West Bengal Plain soils are almost wholly alluvial, ranging from red to brown loams with lateritic soils in the old alluvial area.

The North Bihar Plain soils are alluvial and calcareous In South Bihar Plain, both alluvial and red sandy soils occur The alluvial soils of East Uttar Pradesh vary from sands to heavy clays.

The rainfall is normally ample and rarely excessive. About 284 lakhs of acres fall in the light green belt, the greater part of the rest of the sub-region in the dark green belt and a small fringe in the blue belt. The average rainfall varies from 56 inches in the West Bengal Plain to 44 inches in East Uttar Pradesh and South Bihar Plain. The average number of rainy days ranges from 73 in West Bengal Plain to 50 in East Uttar Pradesh.

Out of the total of 538 lakhs of acres, 512 lakhs of acres are topographically usable. Out of this again, the net area sown is 356 lakhs of acres, or 51 cents *per capita*. Double-cropping is heavy—in fact the heaviest of all the sub-regions of India. It covers 27.9 per cent of the net area sown. Irrigation is also high—21.6 per cent of the gross sown area.

Fallow land is relatively small, being only 9.7 per cent of the net area sown. Unused[†] land is also small (10.8 per cent of the total land area). There is very little forest. Minerals are scarce in this sub-region[†]. Mica is produced in South Bihar Plain (8.6 per cent of India's output). There is also some saltpetre.

25 UPPER GANGETIC PLAINS—This sub-region includes all the districts of Uttar Pradesh with the exception of (i) the ten districts already mentioned as included in the Lower Gangetic Plains; (ii) the five Himalayan districts of Garhwal, Tehri-Garhwal, Nainital, Almora and Dehra Dun, and (iii) the five upland and hilly districts of Jhansi, Jalaun, Hamirpur, Banda and Mirzapur. Three hundred and eighty-nine lakhs of people live here over a land area of 366 lakhs of acres. In terms of India, the population percentage is 10.9 and the land area percentage is 4.8. The land area *per capita* is 94 cents. Practically the whole of it (93 cents) consists of plain tracts only. The land area *per capita* is slightly larger in West Uttar Pradesh Plain (99 cents) than in Central Uttar Pradesh Plain (89 cents).

The soils of the sub-region are mostly alluvial. They vary widely in texture from clay and loam to sandy types. A few typical black cotton soils also occur in Allahabad district.

The rainfall is not so heavy as in the Lower Gangetic Plains. The main bulk of the Upper Gangetic Plains (248 lakhs of acres) falls in the light green belt: only a small area (31 lakhs of acres) falls in the dark green belt. This

* This excludes not only the net area sown, current fallows and forests but also uncultivated land put to various kinds of quasi-agricultural and non-agricultural uses, such as village sites, town sites, mines and quarries, roads, rivers, channels etc.

† A part of the Ramgany coalfield which extends into Bardwan district is counted as part of the mineral resources of the adjoining North-East Plateau sub-region.

HIGH DENSITY SUB-REGIONS

is counterbalanced by a somewhat larger area (87 lakhs of acres) falling in the brown belt. Following the diminishing trend (as one moves up the Gangetic plains) the average rainfall drops from 44 inches in East Uttar Pradesh of the Lower Gangetic Plains to 37 inches in Central Uttar Pradesh and then to 33 inches in West Uttar Pradesh. The average number of rainy days also diminishes from 50 in East Uttar Pradesh to 45 in Central Uttar Pradesh and 40 in West Uttar Pradesh. As the rainfall diminishes in amount, it tends also to become less dependable. Out of the total area of 366 lakhs of acres, 346 lakhs of acres are topographically usable. The net area sown is 237 lakhs of acres, or 61 cents *per capita*. The double-crop percentage is heavy—24·2 per cent; so also irrigation—24·6 per cent. Fallow land is even smaller than in the Lower Gangetic Plains (5·6 per cent). But the ratio of unused land is rather higher (being 14·8 per cent). The area classified as forest is negligible and minerals of any significance are practically non-existent. [Small quantities of saltpetre are worked at some places.]

26. MALABAR-KONKAN—This sub-region includes the entire west coast of India to the south of the Daman Ganga river. It consists of Greater Bombay, Bombay-Konkan (*i.e.*, districts of Thana, Kolaba, Ratnagiri and Kanara), West Madras (*i.e.*, Malabar, South Kanara and Nilgiri districts), Coorg and Travancore-Cochin. Two hundred and thirty-eight lakhs of people live here in an area covering 239 lakhs of acres. In terms of India, the population percentage is 6·6 and the land area percentage is 2·9. The land area *per capita* consists of 100 cents. The terrain here is such that it is impossible to demarcate a topographically homogeneous territory without cutting clear across administrative boundaries down to district level. So, the sub-region includes the main chain of the Western Ghats as well as the narrow fringe of coastal plains to its west. Areas of very varied topography are, therefore, necessarily included, and there are corresponding variations in rainfall. The pattern of land utilisation and density of settlement of population differ sharply as between the coastal strip, the slopes of the ghats, and the heights. Out of the total of 100 cents of land area *per capita* in this sub-region, hills contribute 56 cents, while plains account only for 40 cents. There are 3 cents of plateau-land and one cent of mountain-land.

The soils in this sub-region vary from medium black in the north, to the red gravelly, loamy and lateritic soils in the south. Red loams and yellow loams predominate in Travancore-Cochin.

Rainfall is very heavy in Malabar-Konkan—heaviest in India outside the Eastern Himalayan sub-region. The annual rainfall is over 100 inches.

along the west coast from Alibag near Bombay to Cochin in the south. A few stations in Coorg and on the Cardamom hills in Travancore-Cochin get well over 200 inches of rain in a year. Several stations on the western slopes of the South Kanara and Malabar districts receive rainfall of the order of 180 inches. On the eastern side of the ghats the annual rainfall is much less. The Nilgiris, for instance, receive about 55-60 inches and quite a few of the stations receive less than 40 inches. All this is mainly the south-west monsoon. The southern half of the sub-region also gets a little rain from the north-east monsoon. Thus the greater part of this sub-region (194 lakhs of acres) falls in the blue belt and about 32 lakhs of acres in the dark green belt.

The average number of rainy days ranges from 121 in West Madras, 118 in Coorg and Travancore-Cochin to 95 in Bombay-Konkan and 74 in Greater Bombay. The sub-region is, therefore, one of the very few parts of India, of which it can be said that it never suffers from drought. Out of the total area of 239 lakhs of acres, the topographically usable area is 128 lakhs—the hilly country accounts for a heavy write-off. The net area sown is 73 lakhs of acres, or 31 cents *per capita*. Forty-six per cent of the land is classified as fallow—a very high ratio, (in fact, the highest among all the sub-regions). But the unused land ratio is nearly as low as in the Lower Gangetic Plains (10.7 per cent).

The double-crop percentage is 11.0 and irrigation percentage is 12.3—both of them being somewhat below the all-India average.

The area classed as forest is very large (66 lakhs of acres out of a classified area of 231 lakhs). The forests are also valuable. Fishing makes a significant contribution to food supply. The sands of Travancore-Cochin yield ilmenite and monazite which are the principal minerals. Small amounts of mica, manganese and iron ore are also produced. Salt is made along the coast.

27 SOUTH MADRAS—This sub-region consists mainly of the Carnatic plains. It stretches as an extensive tract flanked on the west and north-west by the Western and the Eastern Ghats and bordered on the east and south-east by the Bay of Bengal and Gulf of Mannar, and includes the following districts: Tirunelveli, Ramanathapuram, Madurai, Tanjore, Tiruchirappalli, South Arcot, Chingleput, Madras, North Arcot, Chittoor, Salem and Coimbatore. Three hundred and seven lakhs of people live here on 355 lakhs of acres of land. In terms of India, the population percentage is 8.5 and the land area percentage is 4.4. The land area *per capita* is 115 cents. This breaks up into 76 cents of plains, 28 cents of hills and 11 cents of plateaus. The main hilly country lies in the west and the north-west where the land drops rather abruptly near the

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hills and later slopes gradually towards the sea. In addition, there are several isolated hills within this sub-region.

In the major part of the interior of this sub-region, there are red loams, and medium black soils. Coastal alluvium, though relatively smaller in extent is of much value.

Unlike the rest of India, the principal rainy season of this sub-region does not coincide with the south-west monsoon. As the entire area is hidden by the Western Ghats (*except* for the small opening called the Palghat Gap about 20 miles wide) the full blast of the rain-bearing winds of the south-west monsoon is not felt in this sub-region. October to December is the main rainy season, when about 60 % of rainfall occurs in the coastal strip and about 40 % in the interior. While the average annual rainfall is 37 inches and the average number of rainy days is 49, there are considerable local variations within the sub-region. The main bulk of the sub-region (275 lakhs of acres) falls in the light green belt, while 70 lakhs of acres fall in the brown belt. Most of the latter and a good part of the former are affected by considerable fluctuations in the amount, timing, and duration of rainfall. Out of the total land area of 355 lakhs of acres 269 are topographically usable. The net area sown is 134 lakhs of acres or 44 cents *per capita*. Fallow land is relatively large, being 38.5 per cent. There is a fair amount of double-crop (16.7 per cent) while the irrigation percentage (33.6) is the highest among all the sub-regions. The percentage of unused land is relatively small (12.8). Of the land area, 14.9 per cent is classed as forest. Fair amounts of varied mineral deposits are known to exist, of which magnesite, chromite, iron ore, lignite, limestone and gypsum are the more important. [Actual working on any significant scale is, however, practically limited to magnesite] Salt is made all along the coast.

28. NORTH MADRAS AND ORISSA COASTAL.—This sub-region includes all the east coast districts of Orissá and Madras from Balasore in the north to Pulicat lake in the south. The districts are : Balasore, Cuttack, Puri, part of Ganjam, Visakhapatnam, Srikakulam, East Godavari, West Godavari, Guntur, Krishna and Nellore. Two hundred and eleven lakhs of people live here on 293 lakhs of acres of land. In terms of India, the population percentage is 5.8 and the land area percentage is 3.6. The land area *per capita* is 139 cents. It ranges from 102 cents in the Orissa Coastal division to 156 in North Madras division. The sub-region includes the Eastern Ghats which are of an average height of about 2,000 feet, while some of the peaks are over 5,000 feet in elevation. The break up of the land area *per capita* is therefore

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to 8 cents of plains, 29 cents of hills and 2 cents of plateaus. There are no mountains.

The alluvial soils of the coast (mainly deltaic) are very fertile. As one goes inland, they give place to black cotton and red ferruginous types.

The average annual rainfall is 57 inches in the Orissa Coastal division and the average number of rainy days is 71. The averages fall to 39 and 50 respectively in North Madras division. The bulk of the land (193 lakhs of acres) falls in the light green belt; 64 lakhs of acres, mostly in Orissa Coastal division, fall in the dark green belt; while 35 lakhs of acres (all of which lie in the North Madras division) fall in the brown belt. The rainiest part of the year is from June to September. This sub-region also gets rain from the north-east monsoon during October and November.

Out of the total land area of 293 lakhs of acres, 235 lakhs are topographically usable. The net area sown is 119 lakhs of acres or 57 cents *per capita*. The land classified as fallow is 27.5 per cent. Double-crop is distinctly higher than in South Madras being 22.1 per cent, while irrigation percentage is nearly as high (32.9). The percentage of unused land is practically the same as in South Madras (12.7). Forests are also nearly the same (14.3 per cent). Mineral production is limited to the mining of mica in Nellore, manganese in Visakhapatnam and a little chromite in Krishna. Salt is made all along the coast.

29 ALL FIVE SUB-REGIONS—If we consider all the five high density sub-regions together and compare the territory with the country as a whole, the main results are as follows:

I—The population of the five sub-regions is 1,845 lakhs against India's 3,613 (or 50.1 per cent). The land area is only 1,791 lakhs of acres against India's 8,126 (or 22.0 per cent). So the land area *per capita* is only 97 cents against India's 225 (or 43.1 per cent).

II—But the topographical components of the land in the five sub-regions are far more favourable for cultivation, as shown in TABLE 4.

Topographical components	Percentage of total land area	
	High density sub-regions	India
Plains	80	43
Pluvius	3	28
Hills	17	18
Mountains	.	11
	<u>100</u>	<u>100</u>

we write-off 95 % of mountains, 75 % of hills, 25 % of plateaus and 5 % of plains, we are left with 81 cents of topographically usable land in the high density sub-regions out of 97 cents of the entire land area *per capita*. A similar write-off leaves us only 151 cents out of 225 cents

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of land area *per capita* in India. Actually these 151 cents are reduced to 140 cents when such 'land' as the Rann of Kutch and the Thar desert are written off the plains of India. The write-off is only .16% for the five sub-regions, while it is 33 to 38 per cent for India.

III— The distribution of the land among different rainfall belts is also more favourable in the high density sub-regions as shown in

TABLE 5

Rainfall belts	Percentage of total land area	
	High density sub-regions	India
Blue belt .	11	11
Dark green belt .	23	21
Light green belt .	56	37
Brown belt .	10	24
Yellow belt .	—	7
	100	100

TABLE 5. It should be noted that the ratios of land falling in the blue belt and the dark green belt are very nearly the same in both cases. The advantage possessed by the high density sub-regions is the smallness of the brown belt and the absence of the yellow belt, and a corresponding excess of the light green belt.

IV— When we consider the net area sown *per capita*, we find the difference between the high density sub-regions and the country as a whole is considerably narrowed down. The figure is 50 cents for the former and 79 cents for the latter. From what has already been said it is clear that, acre for acre, the sown area in the high density sub-regions must be more productive than the sown area elsewhere in India, because it includes a much larger proportion of the fertile alluvium of the plains, and a much smaller proportion of the less fertile soils of the plateaus. Higher natural fertility enables less land to be left fallow ; while more ample rainfall enables more land to be irrigated and more land to be sown more than once. The comparative figures of land use are shown in TABLE 6 on next page.

TABLE 6

<i>Indices of land use</i>		<i>High density sub-regions</i>	<i>India</i>
A	1. Percentage of net area sown to total land area	50	35
	2. Percentage of net area sown to topographically usable area	62	56
	3. Double-crop percentage	23	13
	4. Irrigation percentage	25	16
B	1. Fallow percentage	18	22
	Percentage of classified land of—		
	2. Forests	11	15
	3. Other land 'unavailable for cultivation'	17	16
	4. Unused land	12	17

D — Low Density Sub-Regions

WE MAY NOW turn by way of contrast to those sub-regions where density is low and the land area *per capita* is correspondingly high. The extreme instance is the Desert sub-region and next in order are the two Himalayan sub-regions. Lastly, there are three sub-regions in the northern half of the Peninsular Hills and Plateau region—in all of which the density is well below the mean in India. On the whole, the six sub-regions cover a little less than one-half of India's land, and the people living there number only between one-fifth and one-fourth of India's population. The following table shows the population, land area, density and land area *per capita* of these six sub-regions :

TABLE 7

<i>Name of sub-region</i>	<i>Population (IN LAKHS)</i>	<i>Density (NUMBER PER SQ MILE)</i>	<i>Land area (IN LAKHS OF ACRES)</i>	<i>Land area per capita (IN CENTS)</i>
The Desert	46	61	482	1,047
Western Himalayas	90	68	852	944
Eastern Himalayas	124	118	674	542
North-West Hills	104	163	409	394
North Central Hills & Plateau	138	164	537	389
North-East Plateau	290	192	967	333
TOTAL 6 SUB-REGIONS	792	129	3,921	495

LOW DENSITY SUB-REGIONS

We shall now examine what are those conditions of topography, soil and rainfall which distinguish these sub-regions from others, the nature of land use and its relation to the density of settlement of the people.

31. THE DESERT—This sub-region consists of the following western districts of Rajasthan : Ganganagar, Bikaner, Churu, Jodhpur, Barmer, Jalore Pali, Nagore and Jaisalmer. The greater part of the sub-region consists of a land surface on which there is no running water. There are some groups of hills occurring in the eastern part of Jodhpur on the western side of the Aravalli range. Out of the total land area *per capita*, namely 1,047 cents, 971 cents are in plains, 63 cents are in plateaus and 13 cents are in hills. Two hundred and fifty-four lakhs of acres—that is to say, 552 cents *per capita*—are, as already explained, hardly capable of supporting life to any significant extent. They must be left out of the reckoning. Even of the rest, the soils in the south, central and western areas are mostly light and sandy. Fertile patches increase from west to east.

The greater part of the sub-region (90 per cent) falls in the yellow belt. In fact, it is three-quarters of the entire yellow belt. The remaining ten per cent of the sub-region lies in the brown belt. The average rainfall over the whole area is 11 inches and the average number of rainy days only 13.

Village land records are available for only 81 lakhs of acres out of 482. According to available figures, the net area sown *per capita* is 68 cents. Double-crop is negligible. There is a certain amount of localised irrigations. The fallow percentage is large and forests are non-existent. There are reasons to believe that cultivation acreages of this sub-region are under-stated. So the net area sown *per capita* is probably more than 68 cents. It is difficult to make any sort of estimate as to what the true figure might be, but it seems unlikely that it can be any very considerable proportion of the land area *per capita*. Mineral production in the sub-region consists mainly of salt from Sambhar lake, and gypsum in Bikaner and Jaisalmer (which accounts for most of the country's output). A small quantity of low quality coal is also produced in Bikaner.

32 WESTERN HIMALAYAS—This sub-region consists of the entire state of Jammu and Kashmir, two districts of the Punjab (Kangra and Simla), Himachal Pradesh, Bilaspur and five districts of Uttar Pradesh (Garhwal, Tehri-Garhwal, Nainital, Almora and Dehra Dun). Ninety lakhs of people live on 852 lakhs of acres here. Jammu and Kashmir accounts for an estimated 44 lakhs of people on 594 lakhs of acres with a land area *per capita* of no less than 1,345 cents. This state is, therefore, even more sparsely populated than the Desert. In the

remaining parts of the Western Himalayan sub-region there are 46 lakhs of people living on 258 lakhs of acres. The land area *per capita* is 560 cents, which is made up of 380 cents of mountains, 150 cents of hills, 10 cents of plateaus and 20 cents of plains.

The soils in the low-lying plains are mostly alluvial. The texture classes are usually loams and clay loams while stiff clay soils are also found in the valleys. On the hills, the surface and sub-surface soils are stony and sandy.

The average annual rainfall in Jammu and Kashmir is 39 inches. In the rest of the Western Himalayas, the average is 50 inches, the average number of rainy days being 70 to 75. Out of 258 lakhs of acres (*exclusive* of Jammu and Kashmir) 134 lakhs fall in the dark green belt and 89 lakhs in the light green belt. A small area of 35 lakhs falls in the blue belt.

Village records are available for 282 lakhs of acres out of 852. If we exclude Jammu and Kashmir, the net area sown *per capita* is 63 cents against a topographically usable area of 83 cents. Double-crop percentage is high (24.5 per cent) as also irrigation (19.7 per cent). Fallow land is relatively small (10.8 per cent).

Limestone and rocksalt are the only minerals which are worked—the former in the Himalayan foot-hills of the Punjab and the latter in Mandi in Himachal Pradesh. Deposits of copper, gypsum, bauxite, bentonite and magnesite are known to exist but are not worked.

33 EASTERN HIMALAYAS—This sub-region includes the whole of Assam, Manipur, Tripura and Sikkim and also three districts of West Bengal (Darjeeling, Jalpaiguri and Cooch Behar). One hundred and twenty-four lakhs of people live here on 674 lakhs of acres, the land area *per capita* is 542 cents which is much the same as in the Western Himalayas (*exclusive* of Jammu and Kashmir). Out of this total, 114 cents are mountains, 260 cents are hills, 3 cents are plateaus and 165 cents are plains. The major part of the plains in this sub-region is found in the Brahmaputra Valley whose alluvial soils vary in colour from red to reddish brown. Other plain soils of Assam consist of red sand and loam types. In the hills, some heavy clays are found. In Manipur, the red soils are deep and in Tripura red loams (laterites) occur.

The rainfall is abundant, and never failing; it is well over 75 inches in the year in most parts of the sub-region. Owing to the peculiar configuration of the hills in relation to the rain-bearing winds of the south-west monsoon the amount of rainfall varies sharply from place to place. Thus, Cherrapunji in the Khasi and Jaintia Hills receives the world record rainfall of 425 inches per year, while two stations in Nowgong district receive only 48 inches and 60 inches

respectively. The average rainfall for the region as a whole is 108 inches and the number of rainy days is well over 100. Five hundred and seventy lakhs of acres out of 674 fall, therefore, in the blue belt and practically all the remaining land in the dark green belt. A small area of 3 lakhs in the Assam Hills appears to fall in the light green belt.

Village records are available for 391 lakhs of acres out of 674. The net area sown *per capita* is 59 cents against a topographically usable area of 225 cents. Double-crop is 14 per cent and irrigation 16·5. Fallow land is rather high (29·4 per cent). The area classed as forest is relatively small—between one-sixth and one-seventh. The percentage of unused land (48·3) is highest among all the sub-regions of India. If these figures are compared with those of Western Himalayas (*exclusive* of Jammu and Kashmir) we arrive at the first indication of the existence of some parts of India where a reserve of cultivable but uncultivated land is still available. This sub-region contains the only petroleum field of India and it supplies 5 per cent of India's requirements. Coal is found in association with petroleum in Lakhimpur district at the eastern end of the Assam Valley. It is also found on the plateau in the Garo Hills and in the Khasi and Jaintia Hills district. Other minerals known to exist but not worked, are sillimanite in Gauhati and copper in Sikkim.

34. NORTH-WEST HILLS—The sub-region is made up of the whole of Madhya Bharat *except* the three lowland districts (Bhind, Gird and Morena), and eight districts in south-eastern Rajasthan (Udaipur, Dungarpur, Banswara, Sirohi, Chittorgarh, Kotah, Bundi and Jhalawar). One hundred and four lakhs of people live on 409 lakhs of acres, with a land area *per capita* of 394 cents. The sub-region includes the Aravalli hill ranges which run from north-east to the south-west and form the north-western boundary. It also includes the Vindhya and Satpura ranges running east to west, of which the latter forms the southern boundary. The composition of the land area *per capita* is 296 cents of plateaus, 56 cents of hills and 42 cents of plains. The soils are mostly red and sandy. Medium black soils occur in Chittorgarh district and in Madhya Bharat Plateau. A mosaic of red and black soil is found in the Madhya Bharat Hills division. The average rainfall is 35 inches, varying from 30 inches in the Rajasthan Hills to 37 inches in Madhya Bharat Plateau. The average number of rainy days varies from 34 in Rajasthan Hills to 44 in the Madhya Bharat Hills. Out of 409 lakhs of acres, 235 fall in the light green belt and 174 fall in the brown belt. Approximately 44 lakhs of people living in this sub-region are exposed to the seasonal hazards of the brown belt. The net area sown *per capita* is 144 cents against a topographically usable area of 276 cents. Double-crop and

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manganese, graphite and fire clays are found in North-West Madhya Pradesh. Coal (in the Pench Valley field) and manganese (in the Chhindwara district) are the principal minerals which are worked in fair quantities. Coal is also produced in the Vindhya Pradesh division of this sub-region, where limestone is also worked for the manufacture of cement. Small quantities of diamonds are also found here. Deposits of bauxite are known to exist but are not worked. In the Uttar Pradesh districts of this sub-region, glass sands are worked and form the basis of the glass industry of that state. Limestone is also worked for the manufacture of cement.

36. NORTH-EAST PLATEAU— We now come to the last of our six low density sub-regions. This is made up of three parts: the Chhota Nagpur division of Bihar; the whole of Orissa except four districts (Balasore, Cuttack, Puri and Ganjam Agency); and East Madhya Pradesh (that is to say, the districts of Balaghat, Bhandara, Chanda, Raipur, Bilaspur, Durg, Bastar, Raigarh and Surguja). Two hundred and ninety lakhs of people live on 967 lakhs of acres, with a land area *per capita* of 333 cents. The Maikal range of the great Central Indian divide, runs through the north-western part of this sub-region. The range is continued north-eastwards as Korea hills and the divide ends at the Paresnath hills in Chhota Nagpur. The plateau lies generally at a high elevation in the north, the height being about 2,000–4,000 feet above sea level. From the north the area generally slopes southwards or south-eastwards. The remaining portion of the sub-region is at a height of about 500–1,500 feet above sea level. The composition of the land area *per capita* is, therefore, 125 cents of plateau-land, 110 cents of hills and 97 cents of plains, yielding a topographically usable area of 215 cents.

In Chhota Nagpur the soils vary from red gravelly ferruginous to loams and clays. In East Madhya Pradesh the soils are for the greater part typical black cotton type. Red yellow type occurs at the eastern end. The soils of the inland districts of Orissa are mostly red earths with an occasional mixture of lateritic and black soils.

Rainfall conditions are much better here than even in the North Central Hills and Plateaus. The annual average is 56 inches ranging from 54 in Chhota Nagpur to 59 in Orissa Inland. The average number of rainy days varies from 63 in East Madhya Pradesh to 75 in Orissa Inland. Most parts of the sub-region fall in the dark green belt and a relatively small area in the light green belt.

The net area sown *per capita* is 94 cents as against 215 cents which are topographically usable. Double-crop is 14.4 per cent and irrigation 10.8 per cent. Fallow land is slightly on the high side (22.7 per cent). Out of the total area of 952

lakhs of acres, village records are available for 771 lakhs of acres. They show that nearly 240 lakhs of acres are classified as forest. This is the largest area in any sub-region of India. The proportion of classified forests to total land area is also high, being in fact the second highest in India (Malabar-Konkan is first). The unused land ratio is 23.3 per cent. These figures indicate that there is probably still some reserve of cultivable but uncultivated land.

This sub-region is distinguished from all others by its abundance of mineral wealth. One of the three divisions of this sub-region—Chhota Nagpur—produces 82 per cent of India's coal; 57 per cent of India's mica, 46 per cent of India's iron ore, the entire output of India's copper ore, and fairly significant quantities of manganese, graphite, bauxite, limestone and other minerals. Another division—East Madhya Pradesh—produces 46 per cent of India's manganese and a little over 4 per cent of India's coal. It is also known to have large deposits of iron ore and some bauxite, but these are not worked. A third division of this sub-region—Orissa Inland—produces over one-half of India's iron ore, one-sixth of India's manganese and some coal also.

37. ALL SIX SUB-REGIONS—We may now consider all the six low density sub-regions together and compare the conditions prevailing in that group with those of the country as a whole. The results are as follows:

I—The total population of the six sub-regions is 792 lakhs against India's 3,613 (21.9 per cent). The land area is, however, 3,921 lakhs of acres against India's 8,126 (48.3 per cent). The land area *per capita* is 495 against India's 225.

II—The topographical conditions which define the usability of land for cultivation purposes are dissimilar in the different sub-regions. One sub-region where topography is eminently favourable is largely unusable because of the desert.

A heavy write-off is necessary in two others on account of mountains. The other three are mainly plateau-land with a considerable proportion of hilly tracts. The topographical components of land area *per capita* are compared in TABLE 8. Out of the total land area *per capita* of 495 cents the topographically usable area *per capita* is 235 cents (including Jammu

TABLE 8

Topographical components	Percentage of total land area	
	Low density sub-regions	India
Plains	29	43
Plateaus	26	28
Hills	23	18
Mountains	22	11
	100	100

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and Kashmir) The write-off is 53 per cent against India's 34 per cent On balance, it is clear that the topographical conditions are definitely less favourable

III— The distribution of land among the different rainfall belts in these six sub-regions compares with India as shown in TABLE 9 On the whole, it seems that rainfall conditions are somewhat more favourable here than in the country as a whole. The blue belt and

TABLE 9

Rainfall belt	Percentage of total land area	
	Low density sub-regions	India
Blue belt .	16	11
Dark green belt	33	21
Light green belt	32	37
Brown belt	7	24
Yellow belt	12	7
	100	100

the dark green belt are distinctly larger but this might not make much difference, for where the rain falls copiously, suitable land is difficult to find The topographical write-off is heavy. There is a small deficit of 5 per cent in the light green belt but this is offset by a substantial drop in the brown belt It is this which indicates that these sub-regions are certainly not worse off and probably slightly better off as regards

rainfall than the country as a whole. [The yellow belt is slightly large, but the effect of this factor has already been taken into account when the worst part of the desert was omitted from the reckoning]

IV— The net area sown *per capita* is 96 cents as against India's 79 cents It is difficult to say whether the advantage of the larger area is or is not offset by somewhat lower average of soil quality. It is probable there is some offsetting, but it is not complete. The comparative figures of land use are shown below :

TABLE 10

Indices of land use		Low density sub-regions	India
A	1 Percentage of net area sown to total land area	19	35
	2 Percentage of net area sown to topographically usable area	40	56
	3 Double-crop percentage	12	13
	4 Irrigation percentage	10	16
B	1. Fallow percentage	22	22
	Percentage of classified land of—		
	2 Forests	22	15
	3 Other land 'unavailable for cultivation'	16	16
	4 Unused land	27	17

It should be noted particularly that the proportion of net area sown to the topographically usable area is significantly smaller and the unused land ratio is significantly higher. From this it would follow that the low density is not entirely a matter of the available resources being poorer. Such a statement would be certainly true of the Desert, probably also of the North-West Hills and possibly the Western Himalayas. The Eastern Himalayas, the North-East Plateau and the North Central Hills and Plateau sub-regions fall in a different category. It seems probable, as already mentioned, that they contain some reserve of cultivable but uncultivated land.

What is perhaps even more significant is the fact that these sub-regions and more especially the last two among them possess mineral resources of a distinctly higher range and value than anywhere else in India. Today, that fact seems to have very little influence on the relative distribution of people on the land. But it might well make a difference in the future, when the possibilities of industrial development—so clearly indicated by these resources—are more fully utilised.

E—Medium Density Sub-Regions

IN THE LAST two sections, we have completed the review of 11 out of 15 sub-regions of India. The other four sub-regions are shown in the table below together with particulars of their population, land area and land area *per capita* :

TABLE II

Name of sub-region	Population (IN LAKHS)	Density (NUMBER PER SQ MILE)	Land area (IN LAKHS OF ACRES)	Land area <i>per capita</i> (IN CENTS)
Trans-Gangetic Plains	259	332	499	193
South Deccan	315	247	817	259
North Deccan	239	246	621	260
Gujarat-Kathiawar	161	226	456	283
TOTAL 4 SUB-REGIONS	974	280	2,393	246

MEDIUM DENSITY SUB-REGIONS

39. TRANS-GANGETIC PLAINS— This sub-region consists of (i) the whole of the Punjab *except* the two Himalayan districts (Kangra and Simla), (ii) the Patiala and East Punjab States Union; (iii) Delhi; (iv) three lowland districts of Madhya Bharat (Bhind, Gird, Morena); (v) eight eastern districts of Rajasthan (Jaipur, Tonk, Sawai Madhopur, Bharatpur, Alwar, Sikar, Bhilwara, Jhunjhunu), and (vi) Ajmer. Two hundred and fifty-nine lakhs of people live here on 499 lakhs of acres with a land area *per capita* of 193 cents. The entire sub-region lies between about 600–1,500 feet above sea level except in the south-west where a part of the Aravalli ranges enters into Ajmer division. The composition of the land area *per capita* is, therefore, 124 cents of plains, 61 cents of plateaus and 8 cents of hills, yielding 110 cents as the topographically usable area. The Punjab Plain consists mostly of alluvium of the same origin as in the Gangetic plains, generally sandy loam. Mixture of alluvial and aeolian soils cover Delhi, East Rajasthan, Patiala and East Punjab States Union and the lowland districts of Madhya Bharat. To the south and east of Jaipur, the soils are either black cotton or a rich alluvial loam. In Ajmer the soils are mostly sandy.

We have already seen how average annual rainfall diminishes sharply as we move westward up the Gangetic plains. When we reach the Trans-Gangetic Plain the amount becomes quite small. The average ranges from 19 inches in Patiala and East Punjab States Union to 28 inches in Madhya Bharat Lowland. The average number of rainy days ranges from 26 in Ajmer to 36 in Madhya Bharat Lowland. Out of a total of 499 lakhs of acres, only 26 lakhs lie in the light green belt. Four hundred and twelve lakhs of acres lie in the brown belt and 61 lakhs in the yellow belt. A large part of the sub-region is, therefore, exposed to the hazards of drought. Part of the affected area is, however, protected by irrigation.

The net area sown *per capita* is 95 cents against the topographically usable area of 110 cents. Double-crop is fairly high (19 per cent) and irrigation is distinctly high (28 per cent). [The sub-region ranks third highest in India in the ratio of irrigated acreage to the gross sown area.] Fallow land is on the low side (15·8 per cent). Forest land is negligible. The unused land ratio is distinctly small (13·9 per cent).

As in the Gangetic plains, mineral resources are unimportant. Some limestone is produced in the foot hills of the Himalayas and there is some mica production in Ajmer.

40 SOUTH DECCAN— This sub-region consists of four divisions, *viz.*, Mysore, Madras Deccan, South Hyderabad, and Bombay Deccan Southern. The Madras districts are: Bellary, Anantapur, Cuddapah, and Kurnool. The

Bombay districts are : Belgaum, Bijapur and Dharwar. All the districts of Hyderabad *except* Aurangabad, Parbhani, Nanded, Bidar, Bhur and Osmanabad, are included. The general elevation of the sub-region is 1,000–3,000 feet in the north and 2,000–3,000 feet in the south, with a gentle slope towards the east. Three hundred and fifteen lakhs of people live on 817 lakhs of acres with a land area of 259 cents *per capita*. The composition of this area is 175 cents of plateaus, 41 cents of hills and 43 cents of plains—thus yielding 183 cents as the topographically usable area.

In the districts of South Hyderabad and Bombay Deccan Southern the land is covered by medium black soils, red loams and lateritic soils. In Mysore, the soils are predominantly red sand loam type. In the four districts of Madras Deccan, black cotton soils are associated with red loams and sandy loams.

The average rainfall is 32 inches ranging from 24 inches in the Madras Deccan to 35 inches in Hyderabad and 36 inches in Mysore. The average number of rainy days is 39 in Madras Deccan and 56 in Mysore. Approximately 277 lakhs of acres out of 817 fall in the light green belt. Nearly twice that area or 520 lakhs of acres fall in the brown belt. Some parts of the area—notably the districts of Madras and Bombay—are especially exposed to the hazards of drought. Rainfall is not only scanty but capricious; and, in consequence, severe scarcities and famines occur, not merely frequently, but more or less regularly.

The net area sown *per capita* is 114 cents against 183 cents which are topographically usable. Double-crop is almost negligible (2·7 per cent) and irrigation is relatively small (8·9 per cent). The fallow percentage is high (34·7 per cent). A fair amount of land is classed as forest—123 lakhs of acres out of classified total of 806 lakhs. This might be one reason why the unused land ratio is very small (6·6 per cent).

This sub-region is fairly important for its mineral resources. Coal is produced in South Hyderabad (3·6 per cent of India's output). The entire output of Indian gold is produced in Mysore. Mysore has fairly large deposits of high quality iron ore but production is small because there is no coal field in the vicinity. Magnesite and chromite are other minerals produced in Mysore. Manganese is worked in Madras Deccan. Iron ore, limestone, gold and asbestos are known to exist in this area, though not worked. Small quantities of bauxite are produced in Bombay Deccan Southern division.

41 NORTH-DECCAN—There are three divisions in this sub-region, *viz.*, South-West Madhya Pradesh, North Hyderabad and Bombay Deccan Northern. Amraoti, Buldana, Akola, Yeotmal, Wardha and Nagpur are the Madhya

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Pradesh districts. West Khandesh, East Khandesh, Dangs, Nasik, Ahmednagar, Poona, Satara North, Satara South, Kolhapur and Sholapur are the Bombay districts. Aurangabad, Parbhani, Nanded, Bidar, Bhil and Osmanabad are the Hyderabad districts. Two hundred and thirty-nine lakhs of people live on 621 lakhs of acres with an average land area *per capita* of 260 cents. The sub-region is bounded on the north by the Satpuras and on the west by the Western Ghats. The land generally slopes from west to east except in the north where the river Tapi, flowing westward, enters the Arabian Sea. The land area *per capita* is composed of 184 cents of plateaus, 46 cents of hills and 30 cents of plains, yielding 214 cents as topographically usable area.

Heavy black cotton soils occur in South-West Madhya Pradesh and North Hyderabad. The rest of the sub-region contains medium black soils with a fairly considerable area carrying red loam (lateritic) soils. Except in the narrow strip near the ghats, the major portion of this sub-region lies in the rain shadow of the Western Ghats, and the rainfall is therefore low. The general rainfall is 36 inches and varies from 30 inches to 37 inches in Bombay Deccan Northern. The average number of rainy days ranges from 44 to 50. Approximately 303 lakhs of acres out of 621 lakhs fall in the light green belt and 275 lakhs fall in the brown belt. This part of the sub-region is exposed to hazards of drought, though not so severely as parts of South Deccan.

The net area sown *per capita* is 157 cents as against 214 cents of topographically usable area. Double-crop is negligible (1.9 per cent) and the irrigation percentage is exceedingly small (4.2). Fallow land is 25 per cent. The forest area is small and the unused land ratio is extraordinarily small (2.6 per cent, which is the lowest ratio among all the sub-regions in India).

This sub-region is perhaps the poorest in mineral resources—poorer even than the Northern Plains. This is because the sub-region is covered, for the most part, by volcanic lavas. Situated just outside the lava tracts, there is a manganese field in Nagpur district of Madhya Pradesh, which is an outlier of the main fields of Balaghat and Bhandara districts to the east.

42. GUJRAT-KATHIAWAR—This sub-region consists of Kutch, Saurashtra and the districts of Bombay to the north of the Daman Ganga river (*viz.*, Banaskantha, Sabarkantha, Mehsana, Ahmedabad, Kaira, Panch Mahals, Baroda, Broach, Surat and Amreli). The north-eastern tracts of the sub-region consist of portions of the Satpuras, the Vindhya and the Gujrat-Malwa hill ranges. They focus the drainage of the eastern part of this sub-region on to the Gulf of Cambay by a fan of major rivers of which the most famous are the Narmada and the Tapi. One hundred and sixty-one lakhs of people live here on 456 lakhs

of acres of land with a land area *per capita* of 283 cents. This is composed of 255 cents of plains, 27 cents of hills and one cent of plateau. The plains, however, include 75 lakhs of acres of purely nominal land, mostly marshy wastes which includes 59 lakhs of acres in the Rann of Kutch. If this is also written off along with the normal percentages of the different topographical components, the topographically usable area *per capita* is 207 cents.

The sub-region consists of deep black and medium black and alluvial soils. Patches of mixed red and black soils and laterites also occur. Ninety per cent of the rainfall occurs during the monsoon season—June to September. The southern Gujrat plain and the Tapti Valley receive a moderate rainfall of 30 inches to 40 inches, which increases further towards the Satpuras and the north-eastern highlands. Further north in Gujrat, there is a steady decline from 40 inches to 25 inches. There is a steep fall along the Saurashtra coast; and Kutch is semi-desert. The sub-region enjoys a curious distinction. It is the only sub-region which has some part of its land in all the five rainfall belts. The total land area (456 lakhs of acres) is distributed as follows: blue belt (4), dark green belt (17), light green belt (107), brown belt (247), and the yellow belt (81).

The net area sown *per capita* is 129 cents against the topographically usable area of 207 cents. Double-crop and irrigation are very small (3.7 per cent and 3.9 per cent respectively). Fallow land is 20.5 per cent. Forests are negligible. The unused land ratio is much the same as in the Upper Gangetic Plains (14.5 per cent).

Manganese is worked in the Panch Mahals district of Bombay. Other minerals known in the sub-region are gypsum, bauxite and limestone. Salt is made all along the coast, and the output is very large, nearly one-half of the total production of the country.

43 ALL FOUR SUB-REGIONS—Considering all four medium density sub-regions together, the results are as follows:

I—The total population of the four sub-regions is 974 lakhs against India's 3,613 lakhs (or 27.0 per cent). The land area is 2,393 lakhs of acres against India's 8,126 (or 29.4 per cent). The land area *per capita* is 246 cents against India's 225.

II—TABLE 12 on opposite page compares the topographical components of the land area *per capita* in these four sub-regions with those of the country as a whole.

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TABLE 12

Topographical components	Percentage of total land area	
	Medium density sub-regions	India
Plains . . .	39	43
Plateaus . . .	48	28
Hills . . .	13	18
Mountains . . .	—	11
	100	100

From the point of view of topography, the medium density sub-regions are perhaps slightly better off than the country as a whole. As compared with the total land area of 246 cents, the topographically usable area is 174 cents. The write-off is only 29 per cent against 34 per cent for the country as a whole.

III— But this advantage is heavily offset partly because the soil is, on the average, poorer; and even more, because the rainfall is much more unfavourable. This is seen from TABLE 13

TABLE 13

Rainfall belts	Percentage of total land area	
	Medium density sub-regions	India
Blue belt . . .	1	11
Dark green belt . . .	2	21
Light green belt . . .	30	37
Brown belt . . .	61	24
Yellow belt . . .	6	7
	100	100

The brown belt dominates. Sixty-one per cent of the land in these four sub-regions falls in the brown belt, the corresponding ratio for the country as a whole being only 25 per cent.

IV— The net area sown *per capita* is 122 cents out of a total land area of 246 cents. In the country as a whole the net area sown *per capita* is only 79 cents against a total land

area of 225 cents. Quite clearly, there is not only no under-utilization of land, there is clear evidence of excessive use. TABLE 14 on next page compares the main indices of land use as between these four sub-regions jointly and the country as a whole

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TABLE 14

Indices of land use		Medium density sub-regions	India
A	1. Percentage of net area sown to total land area	50	35
	2. Percentage of net area sown to topographically usable area	70	56
	3. Double-crop percentage	6	13
	4. Irrigation percentage	11	16
B	1. Fallow percentage	26	22
	Percentage of classified land of—		
	2. Forests	11	15
	3. Other land 'unavailable for cultivation'	15	16
	4. Unused land	8	17

The figures converge and yield a coherent picture, which is that the pressure of population on land is even greater on these medium density sub-regions than in the high density sub-regions. Though the rainfall is scanty, it is not so small as to forbid cultivation altogether as in the Desert. So, the people have settled and grown in numbers. But the capriciousness of the rainfall and other difficulties of cultivation seem only to provide the people with a strong incentive for attempting cultivation over as large an area as possible.

The fact that the fallow percentage is higher than the average for India not only does not contradict these conclusions, but rather tends to confirm them. Extension of cultivation over sub-marginal land of low productivity must necessarily entail a higher fallow percentage.

F — India and the World

WE HAVE SEEN in the last three sections how the distribution of the people on the land—measured by our chosen index, the land area *per capita*—varies from one sub-region to another. It stands to reason that there must be a fairly close connection between the size of the index and the usefulness of land to provide the food needed by the people who live on it. And we have found, by reference to the simplest of known facts about the topography, nature of soil,

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the amount of rainfall, and the nature of land use— that the figures do hang together. Without attempting anything in the nature of a mathematical correlation— and the data at our disposal are hardly suitable for that purpose— we can perceive how in some areas the people can and do live on less land per head than elsewhere.

45. We have indeed been led beyond this point to the conception of different degrees of utilisation of usable resources. We noticed the apparently anomalous (but, nevertheless, credible) circumstance that the people living in the medium density sub-regions with apparently more abundant land than in the high density sub-regions have in fact had to contend against greater difficulties and exerted themselves more and achieved an even higher degree of utilisation of usable land.

At this stage, it is appropriate that we should carry our review from within our country to the world as a whole, and attempt to form an idea of our own position in the distribution of humanity over the land area of the world.

46. The following table shows the basic facts of comparison between India and the World :

TABLE 15

—	<i>India</i>	<i>World</i>
Population (IN CRORES)	36	240
Land area (IN CRORES OF ACRES)	81	3,251
Area <i>per capita</i> (IN CENTS) :		
All land	225	1,354
Agricultural area	97	351
Arable land	97	126

47. The foregoing figures have been taken from the Year Book of Food and Agricultural Statistics issued by the Food and Agriculture Organisation of the United Nations. What is referred to here as 'arable land' should be deemed to include not only all land actually used for growing food or other crops, (which is what we have hitherto considered as 'net area sown') but also fallow lands

'Agricultural area' according to these publications includes all such land and in addition, what are called 'permanent meadows and pastures'. We have apparently got no land of this distinctive description: our equivalent of such land is included within our total of 'net area sown' and 'fallow land'.

It appears that the average citizen of the world uses only a quarter of the land on which he lives as 'agricultural area'; and he uses only about a third of this agricultural area as crop-land and fallow. On the other hand, we use over two-fifths of the entire land on which we live for 'agricultural' purposes and we cultivate almost all of it. In the result, the world citizen cultivates 126 cents against our 97 cents. The difference between the areas which are cultivated is already very much less than the difference between the areas which are available

What is the explanation for this? One explanation may be that our land area *per capita* includes a somewhat higher proportion of the more productive land. Another may be that we are over-crowded on too little land and are, therefore, unable to pick and choose and have been already compelled to bring under cultivation a good deal of poor land which the average world citizen leaves waste or uses for rough grazing. It may be that the true explanation consists in part of both

Here we are faced with much the same questions with which we started when we observed the inequality of distribution of people on the land in different zones within India itself.

48. It is not very easy to answer the questions firmly, because we are even less certain about the relevant facts of other countries than we are of different parts of our own.

So far as topography is concerned, it does not appear that the average Indian citizen is better off than the average world citizen. It is reckoned that the world consists of: 12 per cent of mountains, 14 per cent of hills, 33 per cent of plateaus and 41 per cent of plains. Our country consists of: 11 per cent of mountains, 18 per cent of hills, 28 per cent of plateaus and 43 per cent of plains. The write-off, purely on account of topography, is much the same. It seems likely, however, that the proportion of land which has to be written off as arid or frozen land is somewhat smaller in India, than in the world as a whole,

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49. While we cannot be sure whether or not the average land of the world is better or worse fitted for cultivation than our land, it is fairly certain that the average land of Europe is definitely better fitted. Europe has fewer land-forms* that curtail food production, than other continents. Europe has also got 'the highest proportion of well-watered land'. Not only is rainfall both adequate and reliable, the rains are gentle and the temperature moderate—the soils are not leached by heavy rains that wash out most of the fertility. The table below shows the comparison between India and Europe :

TABLE 16

	India	Europe (EXCLUSIVE OF EUROPEAN U.S.S.R.)
Population (IN CRORES)	36 1	39 6
Land area (IN CRORES OF ACRES)	81 3	121 8
Area per capita (IN CENTS) .		
All land	225	307
Agricultural area	97	153
Arable land	97	92

The figures of this table merit our very close attention. They show the following :

First,—Europe (which is the most densely populated continent of the world) is less densely populated than India. The average European has more land per capita than the average Indian—the excess held by the former is well over a third of all the land held by the latter.

Secondly,—The average European has brought only 30 per cent. of his land under the plough. The average Indian, on the other hand, has brought under the plough 43 per cent of his land (even though it has a far larger proportion of thin and poor soils, and a less adequate and less evenly distributed rainfall). Only thus is the average Indian able to get 97 cents of cultivated and fertile fields against 92 cents of the average European.

Thirdly,— Because he has got more and better land and has used only a smaller fraction of it for cultivation, the average European is able to have, and does have in addition, 61 cents of agricultural land under 'permanent meadows and pastures'.

These are important facts. They have a direct bearing on the issue much debated these days— whether the problem in India is one of 'over-population' or 'under-development' ; and whether food is short because there is not enough land or because of the alleged 'inefficiency' and 'archaic methods' of Indian farming. Whether or not the assumption be true that the methods of Indian farming are 'archaic' or 'inefficient', *no such assumption is necessary for explaining the difference in the nutritional standard of the average European and the average Indian*. Even in the absence of any difference in farming efficiency, Europe can produce more plant food *per capita* than India because much the same area of arable land *per capita* is available in Europe as in India but with more favourable rainfall and soil conditions. In addition, Europe has got 'permanent meadows and pastures' which *must* provide a supply of milk, milk products, beef, mutton and other foodstuffs of animal origin—for which there can be no parallel in India. Thus out of his own resources, the average European can produce not merely more food than the average Indian (this he needs, in any event, because of the climate) but also better food— richer, better balanced, and more nutritious food. Actually, the average European consumes more food than his land produces. He has managed to do this with the help of overseas imports of food (of the order of about one-fifths of his total consumption).

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Albania, Spain, Ireland, Norway, Sweden and Finland contain almost exactly the same population as our six low density sub-regions, *viz.*, the Desert, Western Himalayas, Eastern Himalayas, North-West Hills, North Central Hills Plateau, and North-East Plateau. The two sets of territories are compared in the table below :

TABLE 17

	<i>High density sub-regions of India</i>	<i>European countries of Group A</i>	<i>Low density sub-regions of India</i>	<i>European countries of Group B</i>
Population (IN CRORES)	18.5	18.6	7.9	7.9
Land area (IN CRORES OF ACRES)	17.9	23.9	39.2	55.3
Area <i>per capita</i> (IN CENTS) :				
All land	97	154	495	700
Agricultural area.	59	127	101	257
Arable land	59	56	101	115

The figures in this table show that all the conclusions which were drawn in the last paragraph about Europe and India as a whole may be substantially repeated with complete validity about each of the two groups of European countries and their counterpart sub-regions of India separately. In the face of these figures there can be no reasonable doubt that, in relation to the natural resources available for the production of food, India is even more heavily over-populated than Europe.

51 We may now conclude this review with a brief glance at two great countries—the United States of America and the Soviet Union—where the relationship between the land and the people is incomparably more favourable. The total number of people living in both these countries put together is slightly smaller than the total number of the people of India. But the land area of these two countries is far more than nine times as large and not far short of ten times as large as India. The basic facts of the comparison are given in TABLE 18 on next page.

TABLE 18

	India	U.S.A.	U.S.S.R.
Population (IN CRORES)	36.1	15.1	19.4
Land area (IN CRORES OF ACRES).	81.3	190.5	590.4
Area <i>per capita</i> (IN CENTS)			
All land	225	1,264	3,046
Agricultural area	97	741	448
Arable land	97	302	287

The figures tell their own story. It is true that the Soviet Union and even the United States of America have a clearly larger proportion of arid and frozen lands than Europe or even India. We have no information of a precise and quantitative character which can help us to make the correct allowance for the overall differences in topography, climate and soil. Even so, the observed differences in *per capita* availability of all land, agricultural area, and arable land are so large that they cannot be attributed entirely or even in large measure to soil differences. The outstanding fact must be recognised—the peoples of the United States of America and Soviet Russia have at their disposal a definitely larger share of the usable land of the World than the peoples of Europe and India.

CHAPTER II

The Pattern of Living—1951

A — Villages and Towns

ARRANGEMENTS for the census count were made village by village and town by town. We have thus got a count of all the different places where people live. The total number of such places is 561,107—558,089 villages and 3,018 towns. Out of 3,569 lakhs of people whom we counted, 2,950 lakhs were found in villages and 619 lakhs in towns.

2. Let us suppose that the entire country is divided by lines drawn from north to south at regular intervals of five miles and by other lines drawn from east to west similarly at regular intervals of five miles. Then, the entire territory over which the census was taken would be divided into 47,074 squares, each of which will be five miles long and five miles broad. Let us refer to the villages falling within each of these squares as a 'village group'. We shall then have 558,089 census villages combined into 47,074 'village groups'. An average Indian 'village group' will consist, in round figures, of a dozen villages, each with rather more than 500 inhabitants. There will be rather more than six thousand villagers in all in each 'village group'.

3. The following table shows how this pattern of 'village groups' differs in different zones :

TABLE I

Zone	Average number of villagers per village	Villages and villagers in an average village group (25 SQ. MILES)	
		Number of villages (ROUND FIGURE)	Number of villagers (IN THOUSANDS)
North India	489	25	12.2
East India	433	18	7.8
South India	1,052	9	9.0
West India	708	7	5.0
Central India	431	9	3.9
North-West India	447	8	3.6
INDIA	529	12	6.3

TABLE I brings out a puzzling fact. Either the size of the village is very large in some zones and very small in others ; or what is called a 'village' means one thing in one zone and another thing in another zone. Let us look at the figures of this table more closely. The figures in the last column are the most straightforward. They show how many thousand villagers are likely to be found in every 'village group'—the imaginary square, five miles long and five miles broad. It is less than four thousand in North-West India and Central India, while it is twelve thousand in North India. The differences between one zone and another simply show that the villagers are more densely settled in one zone than in another. The figures of the last column yield no new information; they throw up in another form, the familiar fact of unequal distribution of people over the land (which has been thoroughly analysed in the last chapter). But there is one difference : the figures are limited to villagers only, town dwellers not being counted.

The next question is the meaning of the figures in the second and third columns. Why is it, that the average South Indian village has such a large number of people (1,052) ? After South India, West India stands out as the zone with large villages, while all other zones have villages with average population ranging between four and five hundred people only. Is there a real difference in the living pattern ? Are the villagers in some parts of the country more gregarious than in other parts ? Density of settlement and gregarious living are two quite different things. An area may be sparsely settled but the few people in it may be living together in a relatively small number of settlements each with a relatively large number of people. Is this the kind of difference we are observing when we look at the second and third columns of TABLE I ?

It would not be safe to read any such meaning into the figures, mainly because the village is reckoned for all administrative purposes (and consequently also for census purposes) as a 'village' may or may not be the same as what we normally mean when we speak of a village. A village in the latter sense, means or implies a cluster of houses (or more than one closely adjoining clusters) whose inhabitants are regarded by themselves as well as by others as a social unit with its identity marked by a distinctive local name. The administrative sense is the '*mauza*'—a settled area with defined boundaries for which village records have been prepared. In the south, there is a development by which contiguous administrative villages defined by boundaries have been grouped together for purposes of land revenue administration. The group is referred to as the 'village'. The variations in the

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figures, therefore, merely bring out the differences in the delimitation of administrative villages. This does not, of course, mean that real differences in the social unit—based on the house-cluster and local name—do not also exist. They do. Thus, for instance, in Travancore-Cochin and West Madras where the average number of inhabitants per village is perhaps the largest, the houses do not cluster at all. The 'village', as it is understood in the rest of India, is scarcely to be found there.

5. In the light of this explanation, it will be easier to understand the variations in the size pattern between different zones, which is shown by the following table :

TABLE 2

Zone	Percentage of rural population living in			
	Small villages (UNDER 500)	Medium sized villages (500-2000)	Large villages (2000-5000)	Very large villages (OVER 5000)
North India	29·8	55·3	13·5	1·4
East India	33·8	48·6	14·3	3·3
South India	9·4	38·5	35·3	16·8
West India	18·1	55·0	23·9	3·0
Central India	35·7	50·4	13·0	0·9
North-West India	30·4	50·9	16·4	2·3
INDIA	26·5	48·8	19·4	5·3

The table shows that the medium-sized village—with inhabitants numbering between 500 and 2,000—is the dominant type in all the six zones. As a general statement, this is perhaps no less true of the village—in its natural sense—than of the administrative village, on which it is actually based.

6. The total number of people living in towns, as mentioned already, is 619 lakhs, a number which is larger than the entire population of Great Britain or France. In terms, however, of India's total of 3,566 lakhs, the urban population is relatively small—the all-India percentage is 17·3—just a little more than one in six. The proportion varies from zone to zone. It is as high as 31·2 per cent in West India and as low as 11·1 in East India. The other four zones, in order, are : North-West India (21·4), South India (19·7), Central India (15·8) and North India (13·6).

Within the zones, there are large variations from state to state and division to division. Thus Greater Calcutta is situated in East India—the zone with the smallest proportion of town-dwellers. The average for West Bengal Plain is as high as 26·1, because of Greater Calcutta. But the zonal average is low because it includes the very large population of Bihar (with only 6·7 per cent in towns), Orissa (with 4·1 per cent) and Assam (with 4·6 per cent). In West India, on the other hand, consistently high ratios are found in different parts of the zone. The urban population ratio is 33·7 per cent in Saurashtra 26·5 per cent and 26·2 per cent in the Northern and Southern divisions of Bombay Deccan and 25·6 per cent in Bombay Gujrat. Within the limits of one state (Madhya Pradesh), we have such large variations as 26·1 per cent in the South-West Madhya Pradesh division, 15·3 per cent in the North-West Madhya Pradesh division and 5·7 per cent in the East Madhya Pradesh division.

The growth of towns has largely depended, at any rate in the past, on the accidents of history and geography. There is, therefore, no particular order or system observable in their distribution.

7 Towns vary in number of inhabitants even more widely than villages. We may adopt a simple four-fold classification and refer to all towns with a

TABLE 3

	Number of towns	Number of town dwellers (IN LAKHS)	Urban popula- tion per- centage
Cities .	73	235	38·0
Major towns .	485	186	30·1
Minor towns .	1,848	178	28·6
Townships .	612	20	3·3
	<u>3,018</u>	<u>619</u>	<u>100·0</u>

population of one lakh and over as 'cities', those with a population range of 20,000 to a lakh as 'major towns', those with a population range of 5,000 to 20,000 as 'minor towns', and those with a population under 5,000 as 'townships'. Then, the pattern of India's urban population is as shown in TABLE 3.

8. The question arises—if there are 'very large villages' with more than 5,000 inhabitants in each, how are they distinguished from minor towns which might also have the same number and more particularly, how are villages distinguished from the townships which have a smaller population than even 5,000.

The answer is that a hard and fast line is very difficult to draw. Some criteria were laid down and the towns were specified at the early censuses. These criteria are reapplied at every census and additions and alterations are

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made to the lists of towns in each state. Generally speaking, it is much more common at each successive census for villages to be reclassified as towns, than the other way about.

9. The tests prescribed for distinguishing towns from villages in different states are based on ideas common to all states, but they are not identical nor have they been applied with meticulous uniformity. Thus, Uttar Pradesh classifies as a town : "(a) every Municipality, (b) every notified area, (c) every town area, (d) cantonment and (e) any other continuous group of houses permanently inhabited by usually not less than 5,000 persons which (having regard to the character of the population, the relative density of the dwellings, the importance of the place as a centre of trade and its historic associations), the State Superintendent of Census Operations decided to treat as a Census Town". In West Bengal, the definition is somewhat stricter. There, a town is : "(a) an area, irrespective of population, which has been declared by the Government to be a municipality, and (b) where a municipality has not been established and yet the Government decides to call it a town for the ensuing census, if the area has satisfied the following tests : (i) it has a population of not less than 5,000, (ii) a density of not less than 1,000 inhabitants to the square mile, (iii) the area has some importance as a centre of trade or distribution or administration, and (iv) about three-quarters of the adult male population are chiefly employed in pursuits other than agriculture". "The fundamental criterion" in Madras is reported to be "the existence of urban features— which can be judged by the way in which the houses are situated and how they have been built and the availability of urban amenities (such as a hazar where one could buy one's normal requirements throughout the year, facilities for education, recreation and medical treatment)".

The percentage of urban population living in townships reflects, to some extent, the differences in these definitions. It ranges from 6·2 per cent in North India to 1·3 per cent in East India. The other zones, in order, are : North-West India (5·9), Central India (4·6), South India (2·0), and West India (1·9).

10. It is possible that places which would have been classified as villages in one state may be classified as towns in others. But the proportion of the urban population living in such places is very small. If we neglect the figures for townships, there is little doubt, the numbers of minor towns, major towns and cities and the statistics of inhabitants of such towns do present a comparable picture of the pattern of urban life in different parts of India.

Minor towns, as mentioned already, account for 28·6 per cent. of India's urban population. They seem to be most important in Central India (where

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the ratio is 35·3 per cent.) and least in East India (where the ratio is 19·1 per cent). The ratios in other zones, in order, are : South India (31·5), West India (30·1), North-West India (27·7), and North India (26·4). The people living in 485 major towns and 73 cities (who number 421 lakhs) are distributed among the zones as shown below :

TABLE 4

Zone	Cities		Major towns	
	Number	Population (IN LAKHS)	Number	Population (IN LAKHS)
North India	14	33	62	24
East India	13	46	82	34
South India	18	49	133	50
West India	11	55	84	32
Central India	8	26	62	23
North-West India	9	26	62	23
INDIA	73	235	485	186

11. In Great Britain and other countries where the urban population is far more numerous than the rural population, towns have expanded so greatly that they have joined up into continuous built-up areas with inhabitants numbering crores. These gigantic house-clusters are referred to as 'conurbations'. We have no such places. But we do have some towns which adjoin one another so closely that it becomes somewhat artificial to refer to them as separate towns. Greater Calcutta is an outstanding instance. It consists of six cities (Calcutta, Howrah, Tollyganj, Bhatpara, Garden Reach and South Suburbs), twenty-one major towns and eight minor towns. Delhi consists of two cities, three major towns and one minor town. There are a number of other instances. A beginning has been made at this census to locate such places, name them as

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'town groups', and to compile information about them as inhabited localities.

TABLE 5

<i>Town group</i>	<i>Population (IN LAKHS)</i>
1. Greater Calcutta . . .	45.78
2. Greater Bombay . . .	28.39
3. Madras . . .	14.16
4. Delhi . . .	13.84
5. Hyderabad . . .	10.86
6. Ahmedabad . . .	7.94
7. Bangalore . . .	7.79
8. Kanpur . . .	7.05
9. Poona . . .	5.89
10. Lucknow . . .	4.97
TOTAL . . .	146.67

12. TABLE 5 shows the ten largest inhabited localities arranged in order of population (on the 'town group' basis).

It is worth noting that though there are only 73 cities among 3,018 towns, the total number of inhabitants of these cities exceeds one-third of the total urban population of India. Very nearly one-fifth of the entire city population of India is found in one inhabited locality, *viz*, Greater Calcutta.

B — Houses and households

EVERY CENSUS of population begins as a census of houses. The people know that a census is coming when an officer comes round to number the houses. Unfortunately however, it is not usual to organise the work as a census of houses. If this had been done, we might have had very useful information about the houses themselves—with what materials they are built, the accommodation they provide, their sanitation, ventilation etc. All that we do have, at this census as in previous censuses, is just the number of 'occupied houses' among those which were numbered at the census. There were 644 lakhs of occupied houses—541 lakhs in villages and 103 lakhs in towns.

14. That gives us almost exactly 6 persons to a house in towns; and 11 persons for two houses in a village. A 'house' seems a simple enough thing, like a 'village' or a 'town'. But if we are to make serious use of statistics, we have to be very precise in defining our terms. Just as we had to enquire what a 'village' was and what a 'town' was, we have also to ask what we mean by a 'house'? In most cases—where there is only one building and it is occupied by only one family—that building is the house and it is the end of the matter.

But we may have a house and one or more out-houses occupied by different families. We may have one building where two or more families live. In some cases the parts of the building in which the different families live may be structurally separated from one another so that in fact they serve as different dwelling places. In some cases there may be no such separation. When we come to cities, we have very large structures—blocks of flats—of which each is a quite distinct dwelling unit. In dealing with such different classes of buildings no uniform system was followed in giving census numbers in the past. At some time and in some places a number was given to each building as such. At other times and places a number was given to every part of a building where a family lived.

At this census we attempted to follow a single system throughout the country. We defined a 'house' and a 'household' separately. A 'household' was a group of people who lived together and took their food from a common kitchen. A 'house' was a building within which people lived; provided that if different parts of the building were structurally separated and provided with *separate main entrances* so as to give independent access to each part, then each such part was to be recognised and numbered as a separate 'house'. In the result, every household must have a house in which its members live. Every house would, in most cases, have only one household living in it. But cases would occur where a house may have more than one household living in it, if the people go in and out of it by the same main entrance but nevertheless keep separate mess within it. The statistics were collected on this basis in all states except West Bengal. In that state a local instruction was issued (for reasons which are not altogether clear) varying the definition of the house, with the result that in urban areas of that state there are more houses than households.

15 One reason for attempting such uniformity was to collect information at this census relating to the 'household' as a distinct unit and not merely for individuals separately. In all censuses upto 1931, the information was, in fact, collected on what was called a 'schedule' where the identity of the household was clear. But a change of system brought about in 1941 did away with this 'schedule'. The system of enumeration became completely individualistic with a separate 'slip' for each individual as the sole record of his enumeration. It saved some time and money, but there were counterbalancing disadvantages—one of which was the loss of information about the 'household'.

So, at this census, a partial reversion to the 'schedule' was made under a new name the 'National Register of Citizens'. The information about 'households' which is furnished in this section has been compiled for sample households read off from the National Register of Citizens. In Bihar, the household

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data—though collected on the all-India basis—were not compiled. In view of this and the difficulty already mentioned about West Bengal's definition of a 'house', the figures for Ea India are not referred to in this section for purposes of comparison with other zones.

16. *Houses and households*—There are, to begin with, 112 households in every 100 houses of a typical Indian village and 124 households in every 100 houses of a typical Indian town. Families occupying the same house but living and messing separately in different parts of that house (which are not structurally separated from one another and provided with separate main entrances) are thus more common in the town than in the village—the difference being represented by 12 per cent in the village and 24 per cent in the town.

17. *Number of persons in households*—In every hundred households in the village there are 491 persons; in every hundred households in the town, the number is 471. The difference, though small, is probably not insignificant.

18. *Number of persons in houses*—If we combine the two foregoing sets of data it may be inferred that in every hundred houses in a village 550 people must be living, while in every hundred houses of a town 584 people must be living. These figures are somewhat smaller than one would get if the entire rural population of 2,950 lakhs and the entire urban population of 619 lakhs were divided up among the occupied houses mentioned in para 12 (*viz.*, 541 lakhs of houses in villages and 103 lakhs of houses in towns). There are two reasons for this. One is that the household data are based on a sample and a sampling error is unavoidable. Another (and probably the more important) reason is that the sample household data are *exclusive* of people living in boarding houses, hostels, hospitals, jails and other institutions as well as of people living in camps, members of wandering tribes and other homeless persons.

19. *Males and females*—Out of 491 people in every hundred rural households, 252 are males and 239 are females—there is a male excess numbering 13 in 100 households.

Out of 471 people in every hundred urban households, 248 are males and 223 are females—there is a male excess numbering 25 in 100 households.

It should be noted that there is a male excess both in the village and in the town; the excess is, however, larger in the town than in the village.

20. *Types of households (differentiated by size)*—Let us refer to a household which has three members or less as a 'small' household; one which has 4 or

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5 or 6 members, as a 'medium' household; one which has 7, 8 or 9 members, as a 'large' household; and one which has 10 or more members, as a 'very large' household. How many households of each type would be found among 100 households is shown in TABLE 6 separately for the typical village and typical town.

TABLE 6

Type of household	Number of households in a	
	Typical village	Typical town
Small . . .	33	38
Medium . . .	44	41
Large . . .	17	16
Very large . . .	6	5
TOTAL . . .	100	100

Of the four types, medium households are most numerous, which is what one would expect. That 'very large' households with 10 or more members number

only about one in sixteen is also not unexpected. But it seems a little surprising that every third household in a village should be a 'small household' with three members or less. Such a large proportion of small households is a *prima facie* indication that families do not continue to be 'joint' according to the traditional custom of the country and the habit of breaking away from the joint family and setting up separate households is quite strong. Unfortunately we do not have similar information for past censuses. So, we cannot say whether the percentage of 'small households' has or has not been increasing and we cannot measure the differences in the rate of change in different parts of the country.

21. Information has been collected and compiled about the pattern of household relationship. This is available for households in general— but not separately for rural and urban households. If we consider 100 households (taken proportionately from villages as well as towns) there are 487 persons in them and their household relationship is as shown below :

TABLE 7

Household relationship		Number in 100 households
A {	Heads of households :	
	Male (married)	71
	Male (widowers)	19
	Females	10
Wives of heads of households		71
		171

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TABLE 7 — *concluded*

Household relationship		Number in 100 households
B {	Sons of heads of households	108
	Daughters of heads of households	81
		<hr/> 189
C {	Male relatives of heads of households (other than sons) . . .	48
	Female relatives of heads of households (other than daughters) . .	72
		<hr/> 120
D — Persons unrelated to the head of the household :		
		{ Males . . . 4
		{ Females . . . 3
		<hr/> 7
GRAND TOTAL . . .		<hr/> 487

22. So much for the India pattern. We may now consider the variations of this pattern in different zones for which comparison is possible. The total number of households living in every 100 houses of a village varies from 108 in West India to 118 in North India. The intermediate figures are 109 in Central India, 111 in South India and 113 in North-West India.

In every zone, the number of households per 100 houses is larger in the town than in the village. The excess is almost negligible in North-West India. In other zones it ranges from 5 per 100 houses in Central India to 10 in West India, 13 in North India and 24 in South India.

23 The total number of members of 100 rural households ranges from 473 in Central India to 511 in North-West India as well as North India. It is 483 in South India and 500 in West India. There is practically no difference in the number of members of rural households and urban households in South India. In other zones the number is smaller in urban households.

24 There is an excess of males over females both in the village and the town in every zone. The difference is negligible in South India, but very conspicuous in North-West India and North India. The excess is

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larger in the towns than in the villages, in all zones except one. The figure are shown in TABLE 8 below :

TABLE 8

Zone	Excess of males over females in	
	100 Rural households	100 Urban households
North India	27	46
South India	1	7
West India	4	38
Central India	9	21
North-West India	29	18
INDIA	13	25

25. TABLE 9 at the bottom shows the size-pattern of rural and urban households in different zones. We have noted already that the size pattern of rural as well as urban households presented two main features in the country as a whole. *First*,— medium households (with 4, 5 or 6 members) are the dominant type; and *Secondly*,— small households (with 3 members or less) are more numerous than large and very large households

with 7 or more members. This table shows that these two generalisations are true of every zone. A review of data relating to the states and divisions of a state within each zone shows that these features are observable everywhere except in six divisions, *viz*, West Madras, Travancore-Cochin, Coorg, Vindhya Pradesh, Patiala & East Punjab States Union and Sikkim. It is only in the rural areas of these six divisions that one finds the small household to be less numerous than large and very large households.

TABLE 9

Zone	100 Rural households				100 Urban households			
	Small	Medium Large	Very large		Small	Medium Large	Very large	
North India	33	44	17	6	41	38	15	6
South India	34	44	17	5	34	44	17	5
West India	31	45	18	6	38	40	16	6
Central India	36	44	15	5	40	38	16	6
North-West India	31	44	19	6	38	41	16	5

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26. *Heads of households and their wives*—The total number per 100 households varies from 167 in North India to 176 in Central India. For other zones, the figures are 170 in North-West India and West India and 175 in South India. We may deduce from these figures that the number of widowers who are heads of households must be 33 in North India, 30 in North-West India and West India, 29 in South India and 25 in Central India.

Female heads of households are fewest in North India and Central India (7 per hundred households) and largest in South India (14). Other figures are : 8 in North-West India and 11 in West India.

27. *Sons and daughters of heads of households*—The total number of sons in 100 households varies from 103 in Central India to 116 in North-West India. In other zones the number is : 105 in North India, 110 in West India and 111 in South India.

Sons outnumber daughters in every zone. The difference is largest (34) in North-West India and North India and smallest (22) in South India. The differences in the other zones are : 30 in West India and 28 in Central India.

28. *Persons related to the head of the household (other than sons and daughters)*—The total number of such persons in 100 households is largest in North India (137) and smallest in South India (109). Elsewhere, it ranges as follows : 132 in North-West India, and 119 in West India and Central India.

In every zone, female relatives (other than daughters) outnumber the male relatives (other than sons).

29. *Persons unrelated to the head of the household*—The number per 100 households is smallest in North-West India (1), and largest in North India (13). For other zones the figures are : 7 in West India, 5 in South India and 4 in Central India.

30. This completes our account of the internal structure of the household based on a very brief review of sample households as recorded in the National Register of Citizens. It should be emphasized that the figures given in this section are based on *sample* households taken from the National Register of Citizens and that there are no similar figures of prior censuses with which to compare them. They give a broad picture which is probably reliable. Much closer study, supplemented by local enquiries, is necessary before one can analyse the similarities and differences disclosed by this review and correlate

them with the similarities and differences independently ascertained to exist in respect of social habits and customs in different parts of the country. Only then we shall be able to appreciate the full significance of the data and form a clear mental picture of the pattern of household life in all parts of the country.

C — *Sex Ratio*

IT IS PERHAPS natural that people should expect to find that males and females are equal in number everywhere and at all times. Some surprise is always expressed when the census figures show the contrary. The census figures show not only that males and females are unequal in numbers but also that the magnitude of this inequality is also different in different parts of the country. The difference between the numbers of the two sexes is negligible or relatively small in some parts of the country and quite substantial in others. The difference tends to get larger from one census to another at some places; it tends to get smaller elsewhere.

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TABLE 10

<i>Zone</i>	<i>Natural division</i>	<i>Females per 1000 males</i>
EAST INDIA	Orissa Coastal	1040
	Manipur	1036
	North Bihar Plain	1013
	Orissa Inland	1007
SOUTH INDIA	West Madras	1054
	Travancore-Cochin	1008
	South Madras	1006
	North Madras	1001
WEST INDIA	Kutch	1079
	Bombay-Konkan	1047
CENTRAL INDIA	East Madhya Pradesh	1017

35. In general, the sex ratio is smaller in towns than in villages. For the country as a whole, the sex ratio in villages is 966, while that in towns is 860.

The sex ratio in villages is lowest in North-West India (895). In the villages of South India, females outnumber males, the sex ratio is 1004. In other zones, the rural sex ratio varies thus : 925 in North India, 977 in East India, 979 in Central India and 987 in West India.

The urban sex-ratio is lowest in East India (719) reflecting the deeply disturbing influence of Greater Calcutta. The urban sex ratio is highest in South India (977). It varies in other zones as follows : 820 in North India, 838 in West India, 843 in North-West India and 939 in Central India.

The difference between the rural sex ratio and the urban sex ratio is very large in East India (258). It is smallest in South India (27). In other zones it varies from 40 in Central India to 52 in North-West India and 105 in North India to 149 in West India.

36. The low sex ratio of towns is further emphasized if the ratio is computed separately for cities, that is to say, towns with a population of one lakh and over. In the country as a whole, as mentioned already, there are 235 lakhs of people living in cities— of whom 132 lakhs are males and 103 lakhs are females. The sex ratio for all cities of India is 787. It is lowest for East India (641) and

highest for South India (940). In other zones, the city sex ratio varies as follows : 712 in West India, 801 in North India, 813 in North-West India and 934 in Central India.

The sex ratios for the ten largest cities (town groups) of India are shown

TABLE II

<i>Town group</i>	<i>Sex ratio</i>
1 Greater Calcutta . . .	602
2 Greater Bombay . . .	596
3. Madras	921
4. Delhi	750
5 Hyderabad	989
6 Ahmedabad	764
7 Bangalore	883
8. Kanpur	699
9. Poona	833
10. Lucknow	783

in TABLE II. The enormous differences between Greater Calcutta and Greater Bombay on the one hand and Madras and Hyderabad on the other are worth noting.

37. Are these differences in numbers between males and females really true, or are they merely errors in counting? Some 50 years ago, scholars of western Europe, who studied the results of the Indian Censuses, took the view

that the figures could not be correct. They were accustomed to an excess of females over males in western Europe and thought that a large difference in sex ratio between India and western Europe was unnatural. A number of considerations—it seemed to them—supported their conclusion. The author of the 1911 Census Report summarised these considerations as follows :

"It is well known that the natives of India are reticent regarding their women and that in some parts women are regarded as of very little account. It is, therefore, natural to suppose that the return of them at the Census should be incomplete.

The age statistics show that the proportion of females is lowest between the ages 10 and 20. This is the time of life when it might be supposed that there would be a tendency to conceal the existence of unmarried females.

The increasing accuracy of each succeeding census has been accompanied by a rise in the proportion of females. It is only reasonable to suppose that there is a connection between the two phenomena

The vital statistics for the decade 1891-1900 disclosed a relatively low female mortality and in this respect they were confirmed by the mortality rates deduced from the age return of the last Census."

38. A reasoned refutation of all these arguments is furnished at some length in the 1911 Census Report. The main point was that if the female deficiency was due to omissions, then omissions must be of the order of 9 per cent which—in view of the arrangements which had been perfected by 1911—was

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altogether out of the question. The theory of omissions was also contradicted by internal evidence :

"The Census staff being more largely composed of permanent officials, was more efficient in the Punjab than in most other parts of India, but it is here that the deficiency of females is most marked.... If reticence regarding women had any effect, it would reduce the proportions for Muhammedans more than those for Hindus but in almost all parts of India the proportion of females among the adherents of that religion is relatively high.... In the Punjab, where the general proportion is very low, it is lowest among the Sikhs, who on the whole, are least reluctant to talk about their women.... There is a difference of more than a hundred in the proportions per mille between two of the natural divisions in the Madras Presidency although women hold exactly the same position in both. The animistic tribes neither scorn nor seclude their women, but there are extraordinary differences among such tribes in different parts of India."

The reality of female deficiency, where this is shown by census figures to be very pronounced, was also independently attested by certain social conditions which were known to exist "such as the very high bride-prices which are commonly paid.....".

39. In 1911 it was necessary to establish the reality of female deficiency in India by elaborate arguments. This is no longer necessary for two reasons :

First,— Successive censuses have since repeated and confirmed the pattern of difference in the sex ratio. This is seen from the following table :

TABLE 12

Zone	Sex ratio (GENERAL POPULATION PER 1000 MALES)			
	1921	1931	1941	1951
North India	909	904	907	910
East India	986	967	951	945
South India	1011	1010	1001	999
West India	941	941	941	938
Central India	972	968	966	973
North-West India	853	863	871	883
INDIA	956	951	946	947

Secondly,— We have carried out an actual verification of the 1951 Census count, organised on a random sample basis throughout most parts of the country.

We know not only that the people who were omitted from the count were relatively few—we know with reasonable certainty what proportion of the population they actually were. We also know the sex ratio of the people who were ascertained, by verification, to have been omitted. It is true that among those who were omitted, there were more females than males in all zones (with the exception of Central India where there were a few more males than females). But we know what the differences were. We can calculate (from the ascertained figures) that if allowance were made for the omission, the sex ratio for India should be 949 instead of 947; 1001 instead of 999 in South India; and 885 instead of 883 in North-West India. The difference involved in making or not making an allowance for omissions is thus altogether negligible. We may proceed on the basis that *the numbers of the sexes do, in fact, differ in the manner indicated by the published census figures.*

40. In recent years, figures have been furnished for a great many countries of the world. There are, however, still very large gaps and the statistics of all countries cannot be regarded as equally reliable. Such as they are, the figures show that in the world as a whole, the sex ratio is probably 992—that is to say, there is perhaps a male excess in the world as a whole, but, if there is, it is very small. It is certain that the sexes are more nearly equal to one another in the world as a whole than they are in India. We have seen that there are large variations in the sex ratio between different parts of India. In the same way, there are also large variations between different parts of the world. In all countries of Europe (except Ireland and Bulgaria) there is an excess of females. This seems to be true also of the Soviet Union. In the United States of America there used to be an excess of males among the people of European descent and an excess of females among the negroes. In Canada, Australia, New Zealand and South Africa there has always been a male excess among people of European descent. The South American countries show instances both of male excess and female excess. A large female excess seems to be a general characteristic of many peoples of Africa. It is found in the Gold Coast, Nigeria, Uganda, and Tanganyika. In Morocco and Tunisia, however, there is a male excess.

41. How do such differences arise? It is easy enough to see why a female deficiency should be found in cities and the major towns. It arises mainly by migration of people who go there in search of livelihood. These are, in the first instance, mostly men. It is true that when the men settle down the women may move up to join them—but this does not happen invariably, and there is always a very considerable time-lag. So long, therefore, as towns continue to grow; they are apt to have a diminishing sex ratio. When this

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process stops, and the towns grow mainly by the excess of births over deaths, the sex ratio tends to change in the opposite direction and towards equality. Somewhat similar considerations apply to a whole area (including villages and towns) if it is receiving migrants in large numbers. An important reason for the female excess of Europe and the male excess of people of the same stock in America, Oceania and Africa must no doubt be found in the selective character of migration.

42. This would not, however, explain the female deficiency of India, much less of North India because the migratory movements in question are too small in relation to the total population.

The true explanation has to be found in two facts: *First*,— Males and females are not born in equal numbers; and *Secondly*,— They do not die in equal numbers either in infancy and childhood or in old age or in any particular age-group, or at all ages taken together.

43. If we examine the statistics of registration of births in Madras for 10 years preceding the 1951 Census, we find that for every 1000 male children born during the decade, only 948 female children were born. The ratio was as high as 959 in one year (1941) and as low as 937 in another year (1949). These figures— which are not very different from one another— represent the extremes; the ratios for all other years fell between these two limits.

A similar examination of the statistics of ten years in three other states besides Madras, gives us the following results :

TABLE 13

State	Sex ratio at birth during 1941-50		
	Average	Highest during decade	Lowest during decade
Madras . . .	948	959	937
Madhya Pradesh . .	939	946	921
Bombay . . .	935	937	931
Uttar Pradesh . .	857	874	843

These figures are very instructive and three points should be noted about them:

First,— In every case, there is a definite excess of male births over female births ;

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Secondly,— The excess is very much more pronounced in Uttar Pradesh (North India) than in the other three states (which may be taken to be broadly representative of South India, Central India and West India); and

Thirdly,— The lowest and highest values recorded over a period of ten years do not differ very much; and this fact shows that the occurrence of an excess at birth is not an accident, nor is the fact that this excess is much more pronounced in Uttar Pradesh than in the other states. It would seem that we are face to face with the working of some biological law. Is that conclusion valid or is it vitiated by the fact that all births do not get registered? We know there are omissions in the registration of births. It is also true that the extent of such omissions is not the same in all the states. It cannot, therefore, be denied that it is difficult to be certain on the conclusion stated. It is, however, exceedingly unlikely that the omitted births, if registered, would alter the pattern so materially as to invalidate the conclusion. The causes which lead to the omissions of registration of births are not peculiar to female births. Female births are not much more likely to get omitted than male births. It is difficult to think of any kind of systematic bias which would lead to continuous and universal suppression of female births in such large numbers.

44. We must accept the existence of a male excess at birth as a fact. A deficiency of females arises in all parts of India as a biological phenomenon. It is believed that this happens in almost all parts of the world. Nature having given rise to inequality, then appears to set about redressing it. There is a bias in infant deaths just as there is a bias in births. Male infants die in larger numbers than female infants before completing the first year of life. The following table shows the figures for the same four states for which data regarding sex ratio at birth were given already :

TABLE 14

State	Sex ratio of infants who died within one year of birth during 1941-50		
	Average	Highest during decade	Lowest during decade
Madras . . .	870	878	840
Madhya Pradesh. .	844	859	828
Bombay . . .	866	883	841
Uttar Pradesh . .	790	812	765

SEX RATIO

Here again the question arises, can we be sure that we are not being misled by the selective omission of female infant deaths? All things are possible— but we have to judge what is probable. Large and consistent differences such as we see in TABLE 14 cannot be attributed to this cause. There is, fortunately, some corroborative evidence. If it is really true that fewer female infants die than male infants, then the sex ratio of all infants living at any one time must be closer to 1000 (the index of equality) than the sex ratio at birth. This is exactly what the census figures show, as may be seen from the table below:

TABLE 15

State	Sex ratio at birth (1950 Registration data)	Sex ratio among infants (1951 Census data)
Madras	940	1006
Madhya Pradesh	921	946
Bombay	931	980
Uttar Pradesh	843	941

It will be observed that of all the four states, Madras had the smallest excess of males at birth. Within a year, the inequality is wiped out and female infants outnumber male infants. On the other hand, Uttar Pradesh—which had the largest male excess—has got this excess somewhat diminished, but yet male infants outnumber female infants decisively. [Here again rigorous logic demands that we should make allowance for possible errors in the statement of age at the census. But most people would agree that even if the figures are not exactly correct, they provide good enough corroboration.]

45. In the next section, we shall see that just as males alter during the first year of life, it alters and females alter during the first year of life, it alters year as people grow older. The strain of life and the r on women at some ages and on men at others. This numbers of males and females dying at different ages. no uniform rule governing this inequality at all places differ in different parts of the country at the same time a changed from time to time even at the same place. Ti near approach to uniformity towards the end of life. the beginning of life. Among the very old (a in 1 hand of death falls on men more frequently than on wo-

CHAPTER II : THE PATTERN OF LIVING—1951

46 What has been said so far is applicable mainly to what may be called 'normal' mortality. In the past, different parts of the country used to suffer from 'abnormal' mortality. Once every few years, the hand of death fell more heavily than normally—famine and pestilence occurred in extensive areas and took a heavy toll. On these occasions, it has been observed and recorded that deaths took place in notably unequal numbers among males and females. Men used to die more than women when great famines occurred. On the other hand, many forms of pestilence, especially plague, took a far heavier toll of women than of men.

When, therefore, we observe the sex ratio at any one time and any one place we should remember that it is the result of a long previous history of unequal numbers of male births and female births at times corrected and at other times aggravated by unequal incidence of death—normal as well as abnormal. In some places the ratios may have been further modified by emigration or immigration.

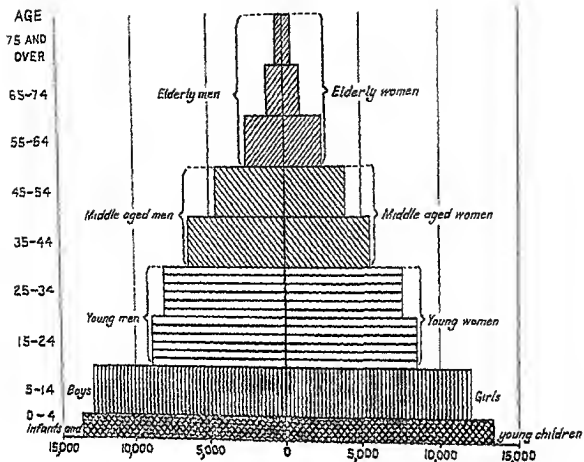
47 When all this has been said, people will still want to know why male births should persistently exceed female births, in all states? Why should this excess of male births over female births be persistently larger in Uttar Pradesh and persistently smaller in other states? Again it may be asked, why is it that the hand of death spares females more than males at the beginning and the end of life; and why the chances of death throughout life, should favour the females more in some states than in others?

It is possible that some completely satisfactory explanation of these facts has been propounded by scientists who may have made a special study of them, but the present writer (who has not been able to make a detailed enquiry) has not come across any such explanation.*

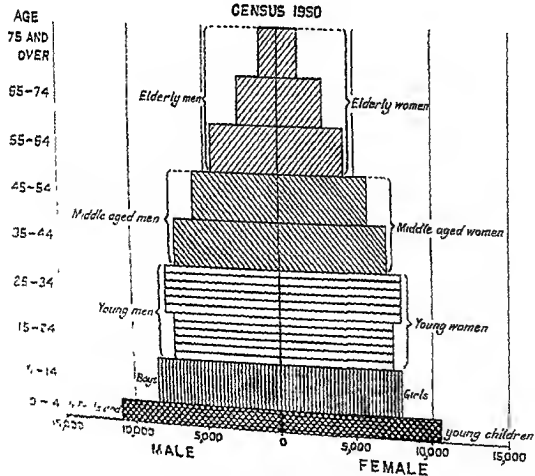
*Mention should be made of an opinion which has been frequently advanced. It is said (on the basis of general impression) that male children receive better care and attention in households than female children and it is surmised that this must have a significant effect on mortality at early age and again after infancy and consequently on the sex ratio. The implication is that this is a more pronounced characteristic of Indian household than of European households, and, within India, of North Indian and North-West Indian households than households in other zones of India. All this seems plausible but it is to be doubted whether the surmise is correct. So long as females survive better than males (and this occurs during and for sometime after the first year of life) the fact is attributed to nature. When the opposite occurs, it is attributed to nurture.

Age Pyramids — India and U. S. A.

AGE PYRAMIDS INDIA CENSUS 1951

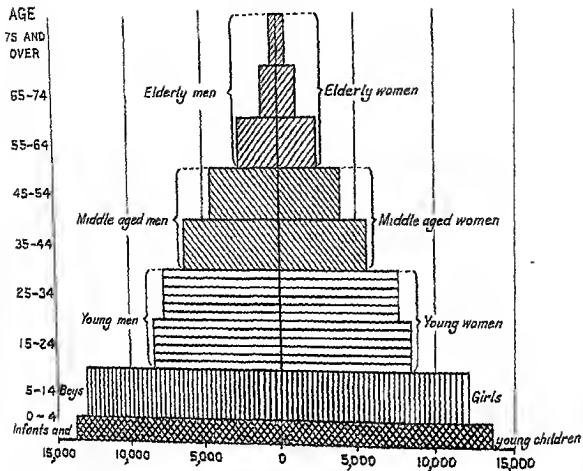


U. S. A. CENSUS 1950

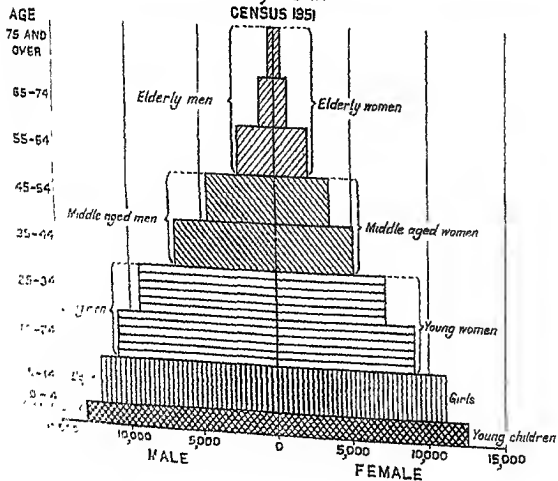


Age Pyramids — India, Rural and Urban

AGE PYRAMIDS INDIA, RURAL CENSUS 1951

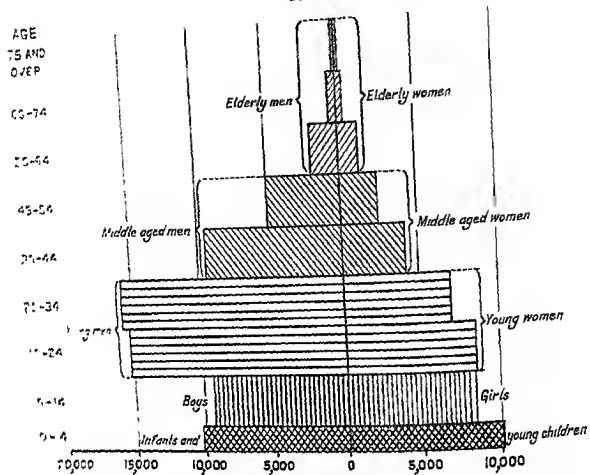


INDIA, URBAN CENSUS 1951

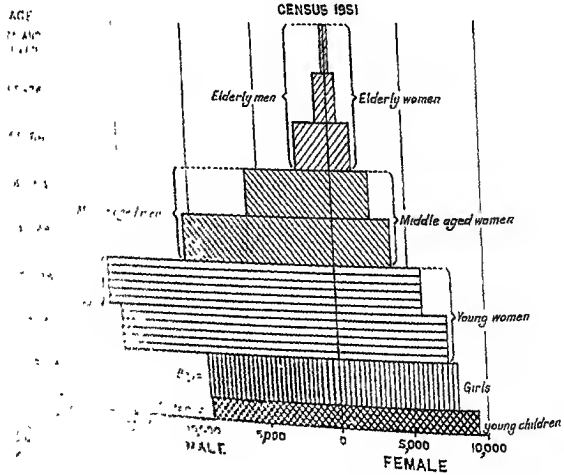


Age Pyramids — Greater Bombay and Calcutta

AGE PYRAMID GREATER BOMBAY CENSUS 1951



CALCUTTA CENSUS 1951



D — *Age Structure*

AT THIS CENSUS, as in all previous censuses, the age of every citizen was ascertained and recorded. In some countries, the actual date of birth is sought to be ascertained— not always very successfully. This is out of the question in India, as the number of people who recollect or keep a record of their date of birth is altogether negligible. We seek only to ascertain the age in number of years. There used to be some difficulty of definition— whether age meant the number of completed years at the birthday preceding the enquiry, or the birthday succeeding the enquiry or at the birthday which is nearest to the enquiry. In India, we have settled down to the first of these three definitions of age. An infant is defined as “a child which has not yet completed 12 months of life”.

49. Specifications of this kind have value only at very young ages— where a few months more or less may make a large difference to the numbers. But, in general, so few people know their age correct to the nearest year that the errors which may arise out of an unprecise definition are small in comparison with the errors which arise out of ignorance of the actual age. All the world over people seem to make much the same kind of error about age. In some countries, the people err in large number than in others. In general, the people who do not know their own age exactly tend to estimate it by quinquenniums or decades. The people who have returned ages ending in 0 or 5 are very much more numerous than those who have returned ages ending in adjoining digits. Others who try to make a closer approximation prefer to think of their age as an even number rather than any odd number (except five). At lower ages, there are some preferences which are even more well-marked. Age 12 is extremely popular and age 18 is nearly so. We do not apparently share, however, one weakness which is prominently observed in some other countries. Our women folk— speaking generally and in large numbers— are not keen on being recorded as younger than they are.

The real difficulty in our country has been not so much to prefer particular digits (of which we have very much in fair share), as complete inability to make any returns at all. A large number of people decline even to make the attempt to state their own age. As part of a regular routine based on experience, enumerators were warned in advance against this contingency and directed that they must make an effort to make the best possible estimate of cases with the help of bystanders. They were equipped for this purpose with a calendar of important events— events of such local notoriety

one could be expected to remember one or other of them, and recall what he was like when the event occurred. The enumerator would then work out the age for him.

Information about women is frequently obtained second-hand. So the estimates are apt to be cruder for women than for men.

50. In spite of all difficulties, we have got a very complete return of age—the number of persons for whom age was not recorded works out to only about 6 per 10,000. It was the practice (followed at the 1931 Census as well as some earlier censuses) to submit the returns of age thus secured to a kind of purification ceremony. The high priest must be an actuary who can use complicated mathematical formulae in order to purge the returns of irregularities caused by biases for particular digits and thus produce 'smoothed' Age Tables. This was a necessary preliminary to a further process of calculation which yielded 'Life Tables'. The practice was followed at this census also. The examination of returns was carried out by Shri S. P. JAIN of the Ministry of Labour, Government of India. He has carried out this work with great thoroughness and prepared 'smoothed' Age Tables and Life Tables. They have been published separately along with detailed explanatory reports submitted by the officer. In addition, the original returns furnishing the figures for each year of age, as recorded, have also been published so that users of census statistics may study for themselves the nature of the biases which were present and make their own independent calculations, if so desired.

While these elaborate precautions are necessary before the data can be used for refined computations, where single year age returns are significant, it is found that figures for each and every year of age are unnecessary for most purposes : figures for broad age-groups of ten years each (or even broader) are ample at the higher ages and five year groups are sufficient at younger ages after the fifth year. As the original returns (whether furnished by the citizen himself or estimated for him by the enumerator) are generally correct to this degree of approximation, it will be found that the 'unsmoothed' figures are good enough—provided they are not relied on for individual ages or narrower age-groups than those mentioned above.

51. The picture presented by these returns may be readily grasped by reference to the 'age pyramid' diagrams preceding this section. Let us follow the first of these diagrams—which relates to the country as a whole, including towns as well as villages.

The bottom slab of the pyramid, it will be observed, is half as broad as all the other slabs above it. This is because it stands for infants and young

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children— those who are 0, 1, 2, 3 or 4 years old (a five-year age-group). All other slabs (which are twice as broad as the bottom slab) stand for ten-year age-groups, viz., 5-14, 15-24, 25-34 and so on except the top-most slab which stands for all ages above 74

The first fact to be noticed is that the length of every higher slab is smaller than that of the lower slab for there were fewer people in it. The number in each slab, is shown below as a percentage of the total number of all ages :

TABLE 16

	Age-group	Percentage
Infants and young children	0 to 4	13.5
Boys and girls	5 to 14	24.8
Young men and women {	15 to 24	17.4
	25 to 34	15.6
Middle-aged men and women {	35 to 44	11.9
	45 to 54	8.5
Elderly persons {	55 to 64	5.1
	65 to 74	2.2
	75 and over	1.0
		<hr/> 100.0 <hr/>

52. Let us now compare the age pyramid of India with that of the United States of America. First we note that the bottom slab in America, is shorter than in India. In America infants and young children are 10.8 per cent while they are 13.5 per cent in India. Looking up, we find the next slab to be even shorter. American boys and girls number 16.3 per cent only, while Indian boys and girls number 24.8 per cent. If we combine the two slabs together they are 26.3 per cent under age 15 in America, while the corresponding number in India is 38.3 per cent.

The next two slabs stand for 'young men and women'. America is somewhat shorter than ours, while the higher slab somewhat larger. Adding up, young men and women are 33.0 per cent in America against 33.0 per cent in India. The next two slabs men and women are both larger in America than in India—12.5 per cent in America is 25.6 per cent against India's 20.4 per cent.

The last three slabs of elderly persons are similarly larger in America. The total number in America is 16.0 per cent against 13.7 per cent in India.

53. It is very important that we should take note of the enormous difference between India and America in respect of the area of the two bottom slabs. Out of every 1,000 persons, there are 271 people under age 15 in America and there are 383 in India. The number is nearly one-half as large again in India as in America. This means—even if an average Indian married couple had the same resources to spend on bringing up their children as an average American married couple, each Indian child can only get a much smaller share of these resources than each American child, because the same resources have to be spread over a larger number. Actually, of course, the resources available to an average Indian married couple are very much smaller—which makes the disparity in the number to be looked after, all the more serious. The dry figures tell their story quite clearly—in terms of food, shelter, care and attention during illness, education and every kind of preparation for life, the Indian child is handicapped unmistakably and of necessity.

54. The following table shows, in one view, how the juvenile proportion varies in different zones of India and compares it with that of Japan, and a few European countries :

TABLE 17

		Percentage to total population of		
		Persons under age 15	Infants and young children	Boys and girls
ZONES OF INDIA *	North India	38.5	13.5	25.0
	East India	37.9	13.7	24.2
	South India	36.9	12.5	24.4
	West India	39.5	13.8	25.7
	Central India	38.7	13.4	25.3
JAPAN		35.4	13.5	21.9
EUROPEAN COUNTRIES	Germany	23.5	7.0	16.5
	United Kingdom	22.5	8.6	13.9
	Italy	26.3	9.2	17.1
	France	21.8	7.2	14.6

*The proportions for the zones of India have been worked out from age tables which excluded displaced persons. The figures for North-West India which are inclusive of displaced persons are as follows:

Persons under age 15	39.6
Infants and young children	14.5
Boys and girls	25.1

AGE STRUCTURE

It may be observed that the juvenile proportion is very similar in all the zones ; it is somewhat smaller in Japan but not very different ; the proportions for all the four European countries are very much smaller.

55. Infants numbered 3·3 per cent of the population (or almost exactly one in thirty) among the people of India.

The highest proportion was found in North-West India (4·1) and the lowest in South India (2·6). The figures for other zones, in order, were : East India (3·7), North India and West India (3·3) and Central India (3·0).

It might seem at first sight that this is probably also the order in which the zones would be placed if arranged according to their birth rate. But this does not follow, necessarily. For one thing, the number of infants counted at the census represents the number born during the preceding 12 months *less* those among them who died during the preceding 12 months. The rates of infant mortality need not differ from one zone to another in the same manner as the birth rate—in fact, they do not. So, the proportion of the net number of infants found and counted need not indicate the order among zones as regards children born.

Again, as noted already, there is need for caution in acting on figures for single years. Though there is little difficulty about recollecting whether a child had completed 12 months or not, one cannot be sure that significant errors did not creep in. A consistent error of even one month in either direction might make a sizeable difference in the resulting number and percentages.

There is also a special difficulty. In compiling the tables on which these results are based, displaced persons were excluded. Such exclusions make little difference to the relative proportions of different age-groups in most parts of the country. But in North-West India where the upheaval was greatest, the figures are bound to be distorted. The distinction must be specially observable among infants and young children since the children of displaced persons are not reckoned as displaced persons and have been counted in.

56. *Infants and young children*—These are all children under 5. They number 13·5 per cent of the total population—that is to say, rather more than one in eight and less than one in seven.

The proportion is 15·6 per cent in North-West India where it is accidentally exaggerated for the reasons already noticed. It is lowest in South India where it is 12·5 per cent. In the other four zones, it is very nearly the same : West India (13·8) East India (13·7) North India (13·5), and Central

India (13·4) The low figure for South India—as we shall see presently—is corroborated by corresponding differences in birth rates and death rates.

57. *Infants, young children, boys and girls*—These include all people under age 15. In the country as a whole, they number 38·3 per cent of the total population. As in the younger groups the proportion is lowest in South India (36·9) and accidentally exaggerated in North-West India (40·4). In other zones, the proportions are as follows: West India (39·5), Central India (38·7), North India (38·5) and East India (37·9).

58. *Comparison with other countries of the world*—Relevant figures are unavailable for Soviet Russia and some other important countries of the world. The figures for some other countries may be affected by error in varying degrees. Such as they are, the information made available in publications of the United Nations shows that in the world as a whole, infants number 2·8 per cent against India's 3·3; infants and young children number 12·4 per cent against India's 13·5; and all people under age 15 number 33·9 per cent against India's 38·3. Those parts of the world where the proportions are low can be distinguished from those parts of the world where the proportions are high as shown below :

TABLE 18

LOW JUVENILE PROPORTIONS			
Territory	Percentage to total population of		
	Infants	Infants and young children	
		Persons under age 15	
Europe	2 0	9·8	26 9
Germany	1·5	7·0	23·5
U K	1 5	8 6	22·5
Italy	1 8	9·2	26 3
France	1·6	7 2	21·8
North America	2·2	10 9	27 6
U S A	2	10 8	27 1
Oceania	2 5	10 5	26 0

HIGH JUVENILE PROPORTIONS			
Territory	Percentage to total population of		
	Infants	Infants and young children	
		Persons under age 15	
India	3·3	13·5	38·3
Japan	2·8	13·5	35·4
South-East Asia	3·3	15·1	40·9
South-West Asia	3·1	16·7	40·6
South & Central America	3·1	14·6	40·1
Africa	2·9	13·7	39·1

59. *Elderly persons*—At the other end of the scale we may compare the variations in the proportion of elderly persons to the total population. For the

AGE STRUCTURE

country as a whole, the figures were 8·5 per cent—or very nearly one in twelve. Among the zones, the highest proportion is found in East India (8·9) and the lowest in West India (7·1). The proportions in the other zones are : North-West India (8·6), South India (8·5), North India (8·4), and Central India (7·8).

If we compare with other countries of the world, we get the result that the proportion of people who live beyond middle age is generally high in those parts of the world where the juvenile proportion is low, and the converse is also true. This is seen from the table below :

TABLE 19

<i>Territory</i>	<i>Percentage to total population of people aged 55 and above</i>	<i>Territory</i>	<i>Percentage to total population of people aged 55 and above</i>
Europe	17·2	India	8·3
Germany	19·1	Japan	11·0
U. K.	21·1	South-East Asia	7·3
Italy	12·0	South-West Asia	9·5
France	21·4	South & Central America . .	7·4
North America	16·5	Africa	8·5
U. S. A.	16·9		
Oceania	17·8		

For the world as a whole, the proportion is 12·0 per cent.

60. We may now turn to the age pyramid for villages and towns of India—separately shown as the third and fourth of the series of ‘age pyramid’ diagrams. The following table shows the comparative figures :

TABLE 20

	<i>Percentage to total population in</i>	
	<i>Villages</i>	<i>Towns</i>
Infants & young children	13·7	12·9
Boys & girls	25·1	23·2
Young men & women	32·3	36·5
Middle-aged men & women	20·4	20·1
Elderly persons	8·5	7·3
	100·0	100·0

This table might suggest the presence of a tendency in towns to diminution in the juvenile proportion. This might easily lead to incorrect inferences

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about the effect of urban life on the birth rate. It should be borne in mind that the relevant figures are a corollary of two facts : *first* that towns have fewer women relatively than villages and so relatively fewer children are born ; and *secondly*, towns grow in part by migratory movements in which persons under age 15 tend to be under-represented.

61 The differences in age-structure between the rural and urban population become greatly exaggerated in the cities. This is clearly brought out by the fantastic distortions of the age pyramid for Greater Bombay and Calcutta cities—the last two of the series of ‘age pyramid’ diagrams. The abnormal excess of males over females is, of course, the main cause of these distortions. Even when allowance is made for this fact, and the age-structure is analysed separately for males and females, the following differences appear :

TABLE 21







<i>Males</i>	<i>Percentage to population of</i>		<i>Females</i>	<i>Percentage to population of</i>	
	<i>India (GENERAL)</i>	<i>Bombay and Calcutta</i>		<i>India (GENERAL)</i>	<i>Bombay and Calcutta</i>
Infants & young children	13·2	7·7	Infants & young children	13·9	13·4
Boys	24·9	14·5	Girls	24·7	22·7
Young men	32·6	49·1	Young women	33·3	40·0
Middle-aged men	21·0	24·1	Middle-aged women	19·6	18·0
Elderly men	8·3	4·6	Elderly women	8·5	5·9
MALES (all ages)	100·0	100·0	FEMALES (all ages)	100·0	100·0

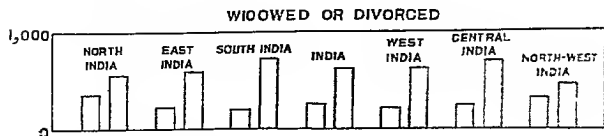
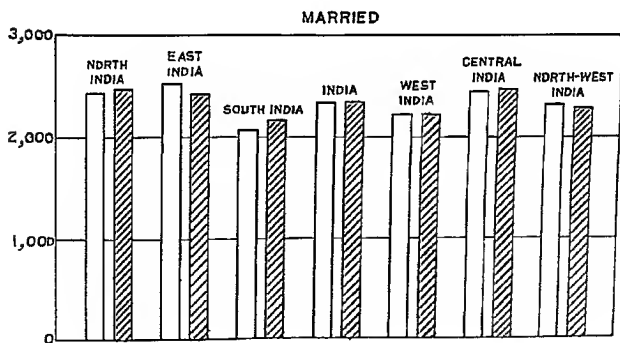
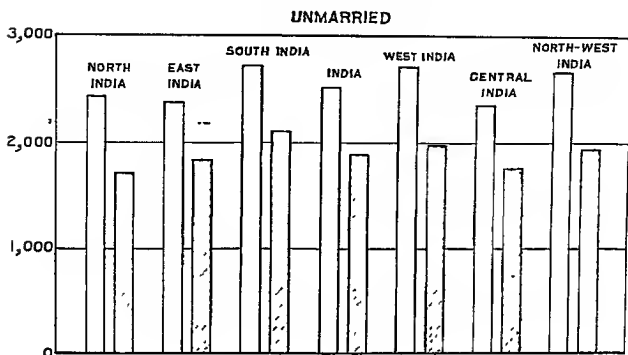
Young men, young women and middle-aged men are (in that order) over-represented in the two large cities. All other age-groups are more or less under-represented in both sexes.

E — Marital Status Pattern

OUT OF EVERY 10,000 persons in India (not reckoning displaced persons), there are 5,133 males and 4,867 females. Among them 2,521 males and 1,886 females are unmarried. If we reckon males and females together, the unmarried people are 44·1 per cent of the population.

DISTRIBUTION BY CIVIL CONDITION OF 10,000 PERS IN INDIA AND THE SIX ZONES

INDEX.
 MALES -----   
 FEMALES -----   



MARITAL STATUS PATTERN

The proportion of unmarried people is highest in South India (48·2 per cent) and is lowest in Central India (41·1 per cent). In other zones, it varies as follows : West India (47·0)

TABLE 22

Zone	Percentage unmarried among males	Percentage unmarried among females
North India	46·3	35·9
East India	46·3	37·8
South India	54·3	42·1
West India	52·6	40·9
Central India	46·5	35·6
North-West India	50·1	41·4
INDIA	49·1	38·8

North-West India (46·1) East India (42·2) and North India (41·4). The proportion must, obviously, be different for males and females. In the country as a whole, roughly every other male person is unmarried ; while rather less than two out of five females are unmarried. The actual percentage for each zone and for India are shown in TABLE 22. South India, it will be noted, stands first as regards proportion of unmarried people even when males

and females are considered separately. The order in other zones is : West India, North-West India, Central India, North India and East India, if unmarried males are considered separately, and North-West India, West India, East India, North India and Central India, if unmarried females alone are considered.

63. According to the law* of the land, child marriages are punishable offences. At the 1951 Census we counted 28 lakhs and 33 thousand married

* *Extract from the Child Marriage Restraint Act, 1929 (Act No. XIX of 1929) :*

"2. In this Act, unless there is anything repugnant in the subject or context,—

- "Child" means a person who, if a male, is under eighteen years of age, and if a female, is under fourteen years of age ;
- "Child marriage" means a marriage to which either of the contracting parties is a child ;
- "contracting party" to a marriage means either of the parties whose marriage is thereby solemnized, and
- "minor" means a person of either sex who is under eighteen years of age

3. Whoever, being a male above eighteen years of age and below twenty-one, contracts a child marriage shall be punishable with fine, which may extend to one thousand rupees.

4. Whoever, being a male above twenty-one years of age, contracts a child marriage shall be punishable with simple imprisonment which may extend to one month, or with fine which may extend to one thousand rupees, or with both

5. Whoever performs, conducts or directs any child marriage shall be punishable with simple imprisonment which may extend to one month, or with fine which may extend to one thousand rupees, or with both unless he proves that he had reason to believe that the marriage was not a child marriage

[*For the purpose of this Act*]

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females, 61 lakhs and 18 thousand married females, 66 thousand widowers and 134

TABLE 23

Zone	Married and widowed persons under 15 years of age	
	Number (IN LAKHS)	Percentage to total population of the zone
North India	25.7	4.1
East India	27.6	3.2
South India	5.2	0.7
West India	6.8	1.7
Central India	19.2	3.7
North-West India	7.0	2.2
INDIA	91.5	2.6

thousand widows— all between the ages of 5 and 14. We do not know the number of married females aged 14 nor of married males aged 15, 16 and 17. The latter marriages are punishable under law, while the former are not. If we may set off one against the other, the total number counted under age 15— nearly 92 lakhs— may be regarded as the approximate number of marriages contracted in contravention of the law. This number was distributed among the different zones as shown in TABLE 23.

North India leads among the six zones, with one person out of every 25 married in contravention of the law. Central India (with one in 27) and East India (with one in 31) are not far behind.

With reference to these deplorable figures, however, it should be mentioned that there is clear evidence that the child marriage rates are diminishing. Married females under 15 were 9.6 per cent of all married males in 1941 and this dropped to 7.4 per cent in 1951. There is a similar drop in North India (from 10.9 to 10.1), in East India (from 10.5 to 8.2), in South India (from 5.0 to 2.6), in West India (from 9.5 to 6.0), in Central India (from 12.8 to 10.6), and in North-West India (from 7.4 to 6.5).

64. If we exclude all persons under age 15 and consider only persons aged 15 and over, the results will be as shown in TABLE 24 on opposite page:

[estimate concluded]

6 (1) Where a minor contracts a child marriage any person having charge of the minor, whether as parent or guardian or in any other capacity, lawful or unlawful, who does any act to promote the marriage or permits it to be solemnised, or negligently fails to prevent it from being solemnised, shall be punishable with simple imprisonment which may extend to one month or with fine which may extend to one thousand rupees, or with both :

Provided that no woman shall be punishable with imprisonment.

(2) For the purposes of this section, it shall be presumed, unless and until the contrary is proved that, where a minor has contracted a child marriage, the person having charge of such minor has negligently failed to prevent the marriage from being solemnised "

MARITAL STATUS PATTERN

TABLE 24

Zone	Percentage unmarried among	
	Males aged 15 and over	Females aged 15 and over
North India	17.9	4.0
East India	17.5	6.0
South India	27.9	10.1
West India	23.0	6.5
Central India	15.8	4.0
North-West India	19.3	6.2
INDIA	20.3	6.4

If we compare the figures for women, we find that the India percentage is 6.4 ; that is to say, out of every 16 women aged 15 and over one is unmarried. In two zones— North India and Central India—unmarried women are fewer ; they are only about one in 25 among women aged 15 and over. South India has the largest number— about one in 10. The other three zones— West India, North-West India and East India— are round about the India average of one in 16.

The following table shows how India compares with other countries of the world in this respect :

TABLE 25

Country	Percentage unmarried among	
	Males aged 15 and over	Females aged 15 and over
India	20.3	6.4
United Kingdom { 1931	36.6	36.2
{ 1951	26.9	25.5
Italy (1936)	37.4	33.0
West Germany (1946)	28.9	29.0
France (1946)	30.5	25.0
U. S. A (1940)	33.2	25.8
Canada (1941)	39.8	33.0

65. It should not be supposed that the percentages shown in TABLES 24 and 25 represent the numbers of women who never marry and remain spinsters for life. If the percentages are taken in later years, they will be smaller

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because more and more of them would get married in later years. Thus, for instance, the proportion of unmarried women to the total population of India diminishes rapidly, with successive age-groups as shown below :

TABLE 26

Age-group	Percentage of total population of women who remain unmarried	
	in the age-group	in all age-groups subsequent to the age-group in the first column
0-4	6.7	12.1
5-14	10.2	1.9
15-24	1.5	0.4
25-34	0.2	0.2
35-44	0.1	0.1

66. We have seen already in TABLE 22 that, in the country as a whole, 49.1 per cent of all males and 38.8 per cent of all females are unmarried. It follows that 50.9 per cent of all males must be either married men or widowers. Similarly, 61.2 per cent of all females must be either married women or widows. [There is a very small number* of men and women, who are divorced persons and who have not re-married. Their number is included among those of widowers and widows] The following table shows the proportions of married men and married women, widowers and widows separately for India and the zones :

TABLE 27

Zone	Percentage of all males who are		Percentage of all females who are	
	Married	Widowers	Married	Widows
North India	46.6	7.0	52.1	12.0
East India	49.3	4.4	50.1	12.1
South India	41.5	4.2	43.4	14.3
West India	43.2	4.2	46.0	13.1
Central India	48.6	4.9	50.3	14.0
North-West India	43.7	6.0	48.8	9.8
INDIA	45.8	5.0	48.4	12.8

*The number of divorced persons in India is 144,786 — 0.4 per cent of the total population

MARITAL STATUS PATTERN

South India, Central India and West India have rather more widows than East India, North India and North-West India. There is one widow for every three married women in South India—while the India ratio is very nearly one to four.

67. It may seem a bit odd that there should be an appreciable difference in numbers between married males and married females—as polygamy, though it exists, is known to be very rare. The explanation is to be found in the fact that the percentages refer to males and females separately and the sexes are unequal in number. Actually married males and married females are almost exactly equal in number in the country as a whole. Out of every 10,000 persons in India, there are 2,353 married males for every 2,357 married females. But the corresponding figures for zones are not nearly so close to one another as the following table shows :

TABLE 28

Zone 1	Number per 10,000 persons who are		Column 3 minus column 2 4
	Married males 2	Married females 3	
North India .	2,441	2,482	+41
East India .	2,532	2,438	—94
South India . .	2,074	2,169	+95
West India .	2,228	2,228	.
Central India .	2,463	2,483	+20
North-West India .	2,326	2,291	—35
INDIA .	2,353	2,357	+ 4

West India is remarkable for its balanced numbers. There is a small, but nevertheless curious, excess of married females in South India. On the other hand, there is an almost equal excess of married males in East India. Similarly, there is an excess of married males in North-West India, matched by somewhat smaller excesses of married females in North India and Central India.

As there is no suggestion of polyandry in East India, it may be assumed that the main explanation for these minor differences must be found in migration. It is probable that a good many missing husbands of South India are earning a living in other zones or outside India, while the wives are at home.

This fact of temporary separation of husbands and wives is brought out more prominently when we consider the figures for villages and towns. Out of 10,000 persons in all the villages of India 2,338 are married males and 2,407 are married females. The excess of married females in villages is of the order of 69 per 10,000

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Among 10,000 persons in all the towns of India, there are 2,429 married males and only 2,105 married females. The excess of married males in towns is of the order of 324 per 10,000.

There are very wide differences in this respect between the zones. Thus in South Indian towns, the number of husbands (2,078) does not exceed the number of wives (2,124); while in the towns of East India there are as many as 2,992 husbands and only 1,909 wives.

68 We may conclude this section with a reference to a somewhat important change that appears to be taking place in the marital status pattern, viz., a fall in the proportion of widows.

The following table compares the proportion of widows and widowers between 1931 and 1951, and shows that the proportion of widows has decreased in every zone :

TABLE 29

Zone	Percentage of widowers to all males		Percentage of widows to all females	
	1931	1951	1931	1951
North India . . .	7.9	7.1	15.1	12.0
East India . . .	4.7	4.4	16.8	12.1
South India . . .	4.1	4.2	17.2	14.3
West India . . .	5.6	4.2	16.1	13.1
Central India . . .	5.4	4.9	15.4	14.0
North-West India .	8.5	6.1	12.7	9.8
INDIA . . .	5.6	5.0	16.1	12.8

The proportion of widowers has also dropped in five out of six zones but the difference is small. The decreases in the percentage of widows between 1931 and 1951 are too large and too consistent to be dismissed as accidental. They are clearly significant; but what do they signify? Do they mean that husbands tend to live longer than they used to and so the proportion of widows is falling? Or do they mean that the custom of non-remarriage of widows is weakening and more women tend to remarry after widowhood than before? There are some valuable indications pointing to increasing longevity as a fact, while there is little evidence of any very striking departures from custom in respect of remarriage of widows. On the whole, one is inclined to accept the former as the main, if not the sole, explanation of the fall in the proportion of widows.

In that case, it may be objected, why is there no similar fall of a similar nature in the proportion of widowers? In support of this objection, it may be contended that it is very unlikely that the conditions which have favoured an increase in the length of life are specially favourable to males only and have not benefited females equally. The objection, though apparently strong, is not conclusive. Since there is no custom of non-remarriage of widowers the proportion of widowers represents mainly the hard core of old men who will not remarry because they are too old, and also a number of others who have become widowers but have not yet remarried but would do so sooner or later. Women may tend to live longer than before, without making any difference to the latter class of widowers and they may not also make a difference to the former if the improved expectation of life is evenly spread over all ages and not concentrated at old ages. The objection is not sustainable.

It is quite possible that both men and women have equally benefited by conditions favouring a longer life than formerly; and yet the result is made visible by a substantial drop in the proportion of widows, and only a very small one in the proportion of widowers. It is probably correct to hold that the drop in the proportion of widows need not necessarily have been caused by any very material change in the custom of non-remarriage of widows. It should, on the other hand, be accepted as one of the indications that fewer people die prematurely and more people tend to live long; or, in other words, a modest improvement in the expectation of life has taken place within the last two decades.

F — *Birth Rates and Death Rates*

BIRTHS AND DEATHS are among the most important events which occur in the life of every household. Our knowledge of how the number and the living pattern of our people have changed in the past and, therefore, our opinion about how they may be expected to change in the future are bound to be vague and sketchy, if not incorrect, unless we achieved a clear understanding of the relationship between these vital events and the changing pattern of life.

70. Government have made arrangements for securing that births and deaths are reported as and when they occur and the occurrences are placed on record together with essential minimum information regarding date and place

and parties concerned. There is the system of official registration of births and deaths. The primary data thus secured are then compiled and returns showing the numbers of births and deaths in different parts of the country as well as birth rates and death rates computed from them, are published at regular intervals by State Governments, for each State and by the Central Government, for India.

If reporting is complete and the basic records are correctly maintained, the changes in numbers recorded by the census at ten-yearly intervals should tally with the balance of births and deaths during the ten-year period, leaving only a relatively small margin to be explained by the net balance of migration of people, in and out of the territory in question.

71 Let us take Uttar Pradesh as an illustration. In 1951 the state had a total population of 632 lakhs. Ten years earlier, according to the 1941 Census, there were 565 lakhs of people in the same territory. The number had grown by 67 lakhs in ten years. There were arrangements for registration of births and deaths in most villages and towns of the state—but some small bits of territory (of the princely states which were 'merged' in Uttar Pradesh shortly before the 1951 Census) did not have them. This is a complication but a small one—because the population of the area where there was no registration was a little under one-fourth of the whole state and we may make allowances accordingly.

During ten years preceding the 1951 Census the authorities of Uttar Pradesh registered 145 lakhs of births. They also registered 97 lakhs of deaths. The excess of births over deaths being 48 lakhs, the population must have increased by that number. According to the census, the increase was 67 lakhs. How do we account for the remaining 19 lakhs? Were they displaced persons who had come into the state from Pakistan? No, we have counted them; they are only 5 lakhs. We also know that at about the time they came in, others migrated to Pakistan from Uttar Pradesh. Though we do not know this number precisely, we have reasons to believe that it was not perhaps far short of the number who came in. So the question about the 19 lakhs remains to be answered. Evidently, a great many births escaped registration; and so also, no doubt, deaths. The birth record is materially incomplete.

The incompleteness is indicated by census results in another way also. The birth rate worked out during 10 years work out to a rate (in round figures) of 25 per thousand. We have already noted in the last section, however, that the birth rate of the state yielded 33 per thousand. Maybe, this is inflated by counting 13 month old babies also, as

infants. But, even so, if we make allowance for the number of infants who must have died during the year preceding the census, the census count of infants is a clear indication that actual births must have exceeded registered births fairly substantially.

The problem is—how are we to have a reasonably close estimate of the actual number of births and the actual birth rate as against the registered birth rate? There is a similar problem about deaths and death rates.

The importance of solving this problem cannot be over-stressed. To illustrate, the registration figures of Uttar Pradesh show that in each of the two previous decades 1931-40 as well as 1921-30, registered births were working out to an average rate (in round figures) of *34 per thousand people per annum*. There is a sharp difference between 25 (the registered birth rate during 1941-50) and 34 (at each of two preceding decades.) If this difference is real and if similar drops were observed in other states, the figures will prove that there is no such thing as a population problem in India; and if there was, the problem was solving itself. That is, in fact, what a number of people think and say. But suppose the difference is due merely to the fact that the registration system has become less efficient than before; and so more births escaped registration during the last decade than during two previous decades. Suppose further, that we could form a reliable estimate of the extent of omission in different decades. Then the inferences to be drawn from the figures will be very different. Our appreciation of the problem and our approach to its solution will turn out to be very different.

72. Uncertainties of this kind are present in every state. Among the major states, Madras, Bombay, Madhya Pradesh and the Punjab are the only four states where the registration system functions reasonably well and omissions are not unduly large. The other states fall into three groups—those for which figures are available over a long period, though they are not very good figures, those for which figures (not very good) are available now for some recent years but not over a long period; and those for which there are no figures at all even now. If we exclude the last two categories, we are left with a territory which contains roughly three-quarters of India's population.

It was no use merely saying that we do not have complete information and can, therefore, come to no conclusions. It will take a long time before we get data which are free from all uncertainties. Meanwhile, we have to form as good a judgment as we can—on all the materials before us—about how the observed growth of population as disclosed by censuses should be split up into births, deaths, and the net balance of migration. To this end, it was necessary

to bring together all available data thrown up by registration of births and deaths as well as by the census and subject them to close and careful study and use every scrap of collateral information which can help us to piece together this jig-saw puzzle.

73 Such a study has been carried out, and it has yielded results which serve our present purpose. The nature of this study, and the results, are set out in detail in a self-contained paper* which is printed as APPENDIX II to this report. The conclusions reached in this paper may be thus stated :

I—The India picture is as follows :

- (i) Births have occurred (during the ten years 1941-50) at an average rate of 40 *per thousand per annum*
- (ii) Deaths have occurred (during the ten years 1941-50) at an average rate of 27 *per thousand per annum*.
- (iii) Hence, the natural increase of the population has been occurring (during the ten years 1941-50) at an average rate of 13 *per thousand per annum*.

We may refer to these rates as the birth rate (40), death rate (27) and natural increase rate (13). They relate to India within her present boundaries during the decade preceding the 1951 Census.

II—The zonal variations of the India picture are as follows :

- (i) The highest birth rate is found in Central India (44), and the lowest birth rate in South India (36 or 37). The birth rates of other zones, in order, are : West India (42), North-West India (41 or 42), North India and East India (for both of which the birth rates are 38 or 39).
- (ii) The highest death rate is found in Central India (34), and the lowest death rate in South India (21 or 22). The death rates of other zones, in order, are : North India (27 or 28), East India (26 or 27 or 28), West India (26) and North-West India (24 or 25 or 26).
- (iii) The highest natural increase rate is found in North-West India (16 or 17) and West India (16), and the lowest natural increase rate is found in Central India (10). The natural increase rates of other zones, in order, are : South India (15), East India (11 or 12) and North India (11).

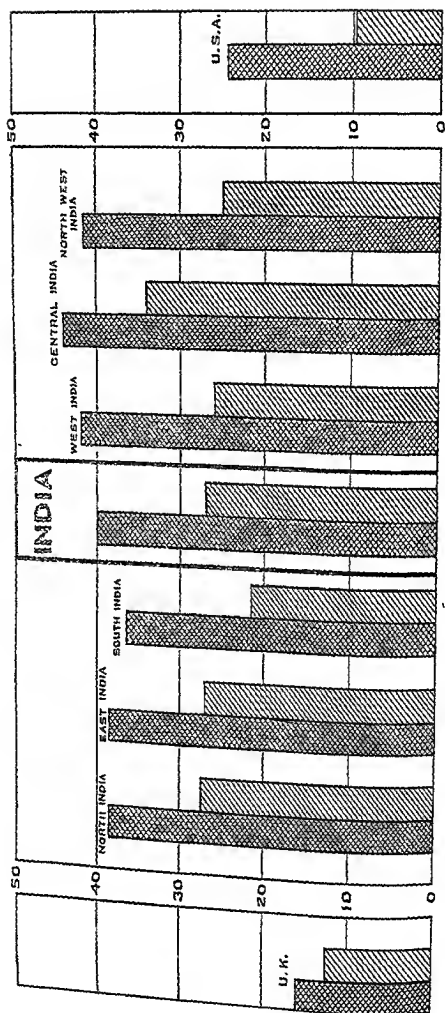
* The paper is not unduly technical and it is hoped it will be read. A technical analysis made by S. P. JAIN, the Census Actuary, who prepared the Age and Life Tables of the 1951 Census, is printed as an *Annexure* to this paper.

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74. The foregoing figures do not represent a simple computation from census data or registration data or both. They are something more complex than a computation, they constitute a judgment. They represent what the present writer considers to be most probably what occurred during 1941-50 in India and the six zones. All the evidence which has led him to form this judgment is fully set out in print; so, it is possible for readers (if they disagree with the conclusions) to form their own judgment.

It will be noted that in some cases, more than one figure have been given—this represents what seems to the present writer to be the unavoidable residuum of uncertainty, which has to be accepted.

The diagram facing this page shows the birth rates and death rates of India and the zones and compares them with the rates for the United Kingdom and the United States of America. The diagram tells its own story of the avoidable waste of life occurring among us all the time.

G — *Maternity Pattern*

WHY DOES the birth rate vary from 44 in Central India to 36 or 37 in South India? The birth rate—by definition—is the number of births which occur among 1,000 people during one year. But as births occur only to married women of certain ages it is their number which is really relevant. It is true that the limiting ages cannot be precisely laid down. It is also possible that some births occur to women who are not married. But, where we are striking a rate for 1,000 people, we do not base ourselves on the actual occurrences of birth among 1,000 people only, but among lakhs and even crores of people. We may, therefore, disregard exceptional occurrences and treat *married women of age 15 to 44* as the people who alone are relevant in this context.

It would follow that if one part of the country contained more married women of age 15 to 44 per 1,000 people than another, then, other things being equal, the former would have a higher birth rate than the latter. The same would be true of the same territory at different times—a change in the proportion of married women of age 15 to 44 would, other things being equal, be accompanied by similar change in the birth rate.

76. What is the meaning of this escape clause—'other things being equal'? In what circumstances could we have the same proportion of married

women of age 15 to 44 in different parts of the country (or at different times in the same part of the country) and yet have different birth rates? Two sets of circumstances may be named. *First*,—the age structure within this group may be materially different. Thus, if we have one lakh of married women of age 25 to 34 and another lakh of married women of age 35 to 44 drawn from the same part of the country, we may be fairly certain that the number of births occurring among the first group in the course of a year will be larger than the number of births occurring among the second group. *Secondly*,—it does not follow that if we compared two groups of married women of the same number and the same age-group (say 25 to 34)—but selected the groups from two different parts of the country, we would get the same number of babies born among them in any one year. Apart from purely accidental and personal differences between one woman and another, it seems possible that there are statistically significant differences between different groups of women: but why should they be? It is difficult to be sure—there may be something in the blood, or the climate, and there may be more in the prevailing habits of conjugal life.

At this census we have been able to collect some information on these matters—in part, through a local census question (which was put in some states only); and in part, through an 'Experimental Census of Birth and Deaths' carried out in a few states, sometime after the main census was over.

Let us begin with a review of the facts which we have ascertained in Travancore-Cochin, about *all women who have had at least one child-birth and who remained married on census day*.

77 Among these mothers, those who were 45 years old or older were separated. The total number of children born to all of them was divided by the total number of such mothers. The result was 6·6. This shows that on an average, a Travancore-Cochin mother who lives to complete her child-bearing period gives birth to more than 6 children but not more than 7. Out of this number (6·6), the average number actually alive on census day was 4·6. Among the children born alive 2 had died, predeceasing their mothers. Let us call these figures—the child birth index (6·6), the child survival index (4·6), and the child loss index (2·0).

78. These indices relate to what may be called the completed maternity experience. The numbers, naturally, increase gradually with age. If we isolate all mothers of age 20 or under the child birth index is 1·2, the child survival index is 1·0, and the child loss index is 0·2. The indices increase at five-yearly intervals as shown in TABLE 30 on opposite page.

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TABLE 30

	Age-group of mothers	Child birth index	Child survival index	Child lost index
Incomplete maternity experience	Under 20	1.2	1.0	0.2
	20 to 24	1.8	1.4	0.4
	25 to 29	2.9	2.3	0.6
	30 to 34	4.2	3.2	1.0
	35 to 39	5.3	4.0	1.3
	40 to 44	6.2	4.6	1.6
Completed maternity	45 and over	6.6	4.6	2.0
AVERAGE FOR ALL AGES		4.3	3.2	1.1

Note how the tempo of child-bearing accelerates. The addition to the family between about 17 (the mean of the under 20 group) and about 22 (the mean of the 20-24 group) is, 0.6. Between 22 and 27, the addition is 1.1. Between 27 and 32 it is 1.3. Then the retardation begins. Between 32 and 37 it is 1.1. The additions to the family tend to become fewer as age advances after what may be called a mid-maternal age—round about age 30.

79. Information was available about the means of livelihood of these mothers. So it is possible to separate them into three groups as members of (i) agricultural landholders and tenants' families, (ii) agricultural labourers' families, and (iii) non-agricultural families. It was also possible to separate the mothers who lived in villages from those who lived in towns. The child birth indices were separately calculated for these groups and are shown below :

TABLE 31,

Maternal group	Child birth indices	
	Age 45 and over	All ages
Agricultural landholders and tenants' families	6.7	4.5
Agricultural labourers' families	6.3	4.1
Non-agricultural families	6.6	4.2
Rural	6.6	4.3
Urban	6.4	4.2

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It is sometimes stated—on the basis mainly of European experience—that the classes which are at the bottom of the social scale have more children and grow in number faster than others. There is little doubt about the place of the agricultural labourer in the social scale anywhere in India. The figures for agricultural labourers' families in Travancore-Cochin do not show that this generalisation is true in that state*. The urban index is slightly smaller than the rural. But the difference is so small that it is probably not significant.

80. One other separation was effected among the mothers : those who commenced child-bearing during ages 15 to 19 and those who commenced child-bearing during ages 20 to 24. Let us call them *Maternity Types A* and *B*. Their child birth indices differed from age-group to age-group as shown in the table below :

TABLE 32

Age-group	Child birth indices	
	Maternity Type A	Maternity Type B
Under 20	1.2	..
20 to 24	2.0	1.3
25 to 29	3.6	2.3
30 to 34	4.8	3.7
35 to 39	6.0	4.9
40 to 44	6.8	5.8
45 and over	7.3	6.4

The figures of this table indicate the result to be expected if by raising the age of marriage (or by other means) the first maternity of all mothers of *Type A* got postponed uniformly by five years. The result would be a reduction of maternity among mothers of *Type A* by approximately one-eighth. The reduction in the birth rate will be even smaller, this depending on the proportion which mothers of *Type A* bear to the total number of mothers.

81. The child birth indices were also calculated for mothers who had become widows by census day. It was found that on an average for all ages, the child birth index of widowed mothers was larger—4.9 against 4.3 of the still-married. This is, of course, due to the fact that the higher age-groups predominate among widows. The comparison for ages 45 and over yields 5.5 as the index for widowed mothers against 6.6 for mothers who remained married on census day.

* Nor is it true of any of the three divisions of Madhya Pradesh vide para 83.

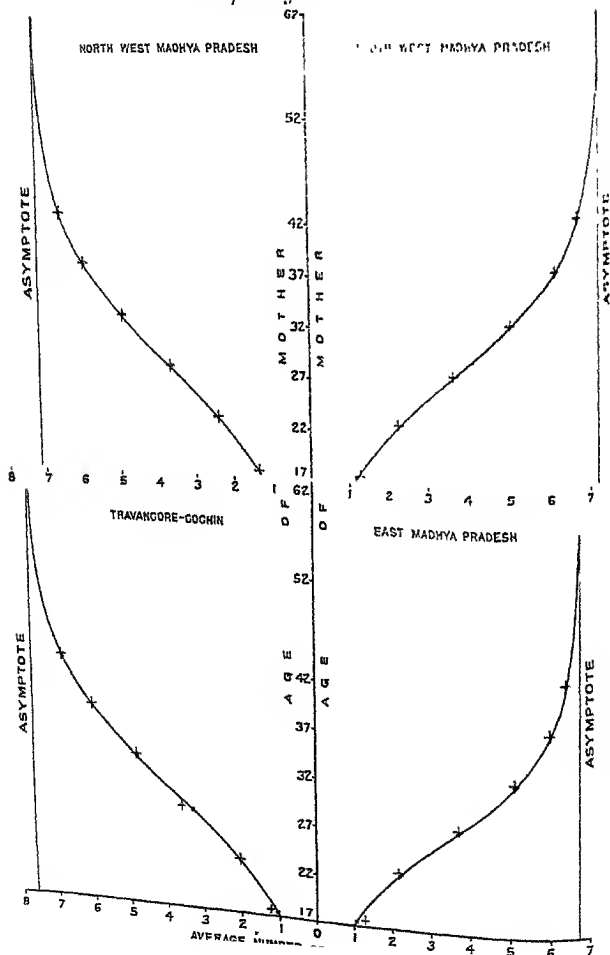
Logistic Graduation of Maternity data

LOGISTIC GRADUATION OF MATERNITY DATA MATERNITY TYPE A

AVERAGE NUMBER OF CHILDREN BORN

Crosses represent observed values

Dots represent graduated values

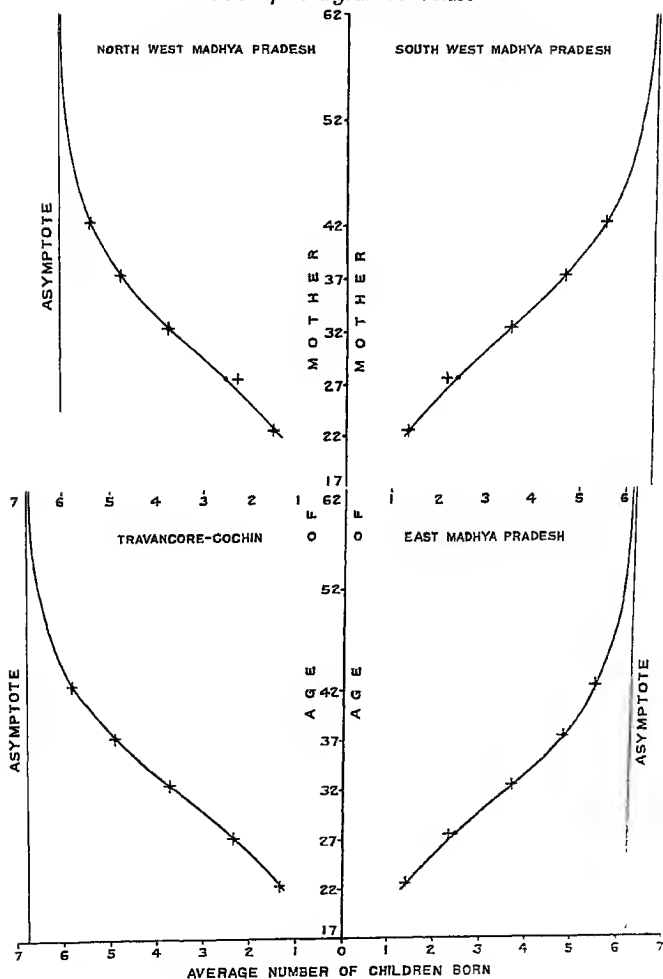


LOGISTIC GRADUATION OF MATERNITY DATA MATERNITY TYPE B

AVERAGE NUMBER OF CHILDREN BORN

Crosses represent observed values

Dots represent graduated values



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82. Data of the same nature as those reviewed above were also collected and compiled for three divisions of Madhya Pradesh. The comparison is shown below in respect of completed maternity experience of still-married mothers (age 45 & over) :

TABLE 33

<i>Natural division</i>	<i>Child birth index</i>	<i>Child survival index</i>	<i>Child loss index</i>
East Madhya Pradesh . . .	6.1	3.6	2.5
North-West Madhya Pradesh . . .	6.3	3.6	2.7
South-West Madhya Pradesh . . .	6.6	3.6	3.0
Travancore-Cochin	6.6	4.6	2.0

Two features of this table are noteworthy :

First,— It will be seen that the number of children borne by mothers aged 45 and over is not higher in any of the divisions of Madhya Pradesh than in Travancore-Cochin. In fact, the figure is slightly smaller in two divisions of Madhya Pradesh. Yet there is no doubt that the birth rate in Madhya Pradesh is very distinctly higher than in Travancore-Cochin. It is clearly verifiable that the difference is caused by differences in the proportion of married women of different age-groups to the total population.

Secondly,— The child loss index is unmistakably higher in all the three divisions of Madhya Pradesh than in Travancore-Cochin. This fact is in accord with much other evidence which points to Madhya Pradesh as having a very high death rate.

83. A comparative study of the figures of Madhya Pradesh with those of Travancore-Cochin indicates that the features already noticed in Travancore-Cochin are also observable in Madhya Pradesh divisions. The tendency for the tempo of child-birth to accelerate until a mid-maternal age is reached and then to relax as age advances, is clearly observed. In general, the 'rural/urban differentials' and 'social class differentials' do not appear to be important. There is a diminution in the total number of children born when the age of commencement of child-birth is postponed, but the difference is not very striking.

It may be mentioned that a sample enquiry made in villages in two groups of districts of West Bengal also brought out data which exhibit the same

features. The child birth index of mothers aged 45 and over came out to be 6.3 in both groups of districts.

The extent to which the census figures of Travancore-Cochin and Madhya Pradesh divisions, as well as the sample enquiry figures of West Bengal might be affected by error has not been studied in detail. It is noticed, however, that they hang together so well as to justify confidence. In general, it may be observed that there is little likelihood of significant error in the child survival index. It is practically certain that the child birth indices are not overstated. At older ages, some women may have forgotten to count the number of children borne by them, completely. The true figures might, therefore, be somewhat higher than those given above. But judging from the graphs furnished in the diagrams given earlier in this section it seems likely that the allowance required to be made on account of such error is probably not large.

[For fuller information on all these data, reference may be made to the brochure on 'Maternity Data—1951 Census' issued as Census of India Paper No 5 of 1953. Some extracts are also given in APPENDIX II.]

84 Information of this kind is not available for many countries of the world. But very detailed data have been published for the United Kingdom among the papers accompanying the Report (issued in the year 1949) of the Royal Commission on Population. The relevant figures of that country have been extracted and included for reference in APPENDIX VII.

It would seem that the child birth index, i.e., average number of live births per mother after completion of her child-bearing period, exceeded six— in much the same way as in India—for those mothers of the United Kingdom who married in or about 1860. The index has fallen steadily since. It was reduced to 4.0 for women who married in the first decade of this century and is now about 2.4 or not more than two-fifths of the figures observed in different parts of India. It will be noted that the relation between the India Birth Rate (40) and the U. K. Birth Rate (16) is more or less of the same order.

85 There is another—and even more instructive—way in which the salient features of the maternity pattern can be expressed.

Out of all the births which take place during one year, how many are first births, how many are second births, how many are third births, and how many are births of the fourth and higher order? In a paper* published in 1951 by Shri S P JAIN, these questions have been answered on the basis of an

* "A study of birth order statistics of India" published in the *Indian Journal of Medical Research* No 39, April 1951.

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analysis of registration data in thirty municipal towns of India. The 'Experimental Census of Births and Deaths' has yielded some more data for 27 districts of South India, 7 districts of West India, 22 districts of Central India and 5 districts of North-West India. These data relate to the population as a whole—including villages and towns-people in due proportion.

The results are shown in the table below :

TABLE 34

	Number per 1,000 births which are			
	First births	Second births	Third births	Fourth births and births of higher order
South India (27 DISTRICTS)	228	215	181	376
West India (7 DISTRICTS)	209	180	167	444
Central India (22 DISTRICTS)	210	189	162	439
North-West India (5 DISTRICTS)	231	206	151	412
Thirty Municipal Towns of India	209	196	167	428

The figures hang together very well indeed and there is little doubt that we may place confidence in the correctness of the picture which emerges. South India presents a slightly different pattern from West, Central and North-West India, but the difference is consistent with the known differences in birth rates. Speaking generally, first births account for rather more than one-fifth of all births, second births account for very nearly another one-fifth, third births account for about one-sixth of all births; well over two-fifths of all births are fourth births or births of a higher order. We can put the matter even more simply. *The total number of births which occur in the course of one year among about 1,000 people of India is 40. Among these 40 births, 8 births are first births; 16 births are either first births or second births; 23 births are either first, second or third births; and 17 births out of 40 are either fourth births or births of higher order.*

86 For reasons which should be sufficiently obvious and which we shall discuss in the last chapter of this report, we may refer to births occurring to mothers who have already given birth to three or more children as 'improvident

CHAPTER II : THE PATTERN OF LIVING—1951

maternity' (except in the altogether exceptional circumstance where all previously born children are dead). We may refer to the percentage of such maternities to all births as the 'Incidence of Improvident Maternity'. It is extremely important that the attention of the people should be focussed on this factor—the

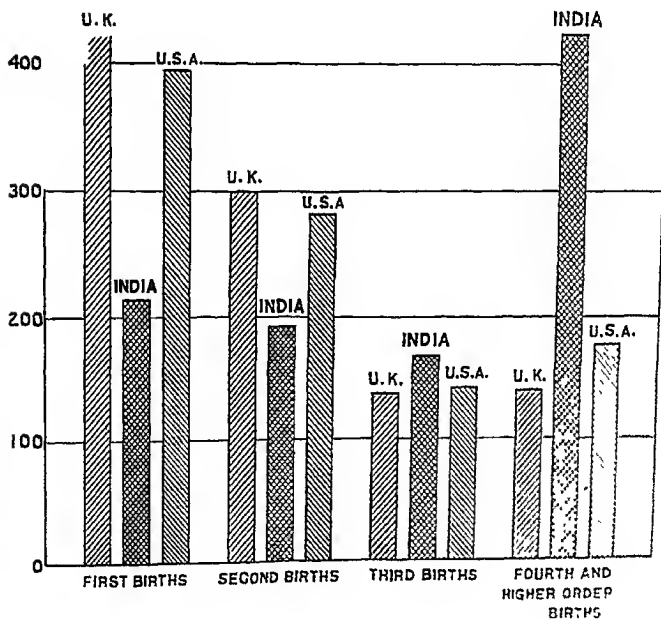
TABLE 35

Country	Incidence of improvident maternity
India	42.8
U.S.A.	19.2
U.K.	14.3
France	19.7
Germany	12.3
(FEDERAL REPUBLIC)	
Japan	33.9

incidence of improvident maternity.
The figures for all those countries of the world for which this information is available have been extracted and furnished in APPENDIX VII. It will be seen that the latest figures compare as shown in TABLE 35. In most of these countries, moreover, the incidence of improvident maternity is steadily decreasing. We are not aware of any evidence that this is happening in India.

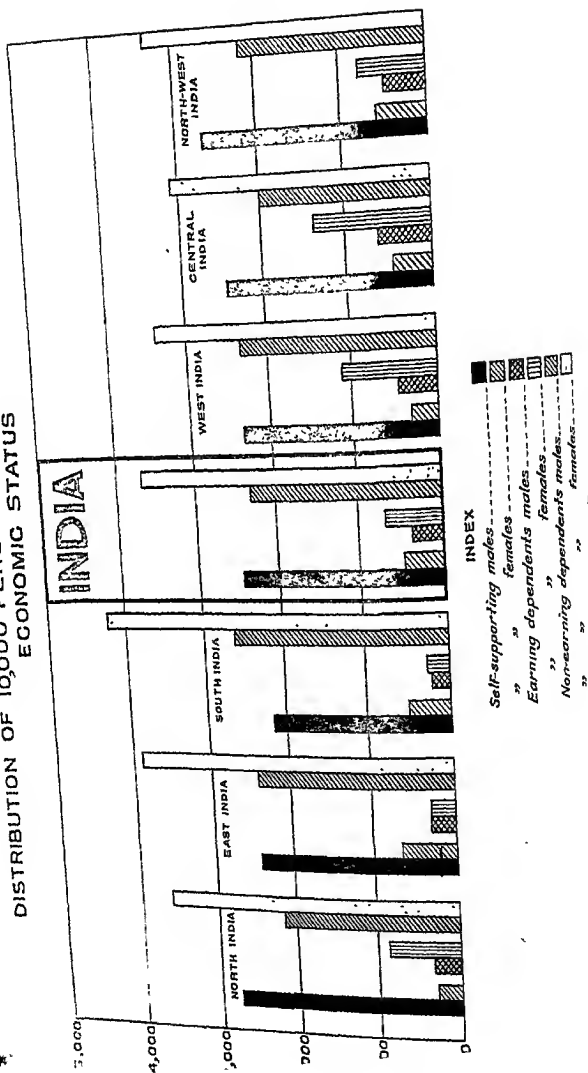
NUMBER OF FIRST BIRTHS, SECOND BIRTHS, THIRD BIRTHS, FOURTH AND HIGHER ORDER BIRTHS OUT OF 1,000 BIRTHS IN INDIA, U. K. AND U. S. A.

500



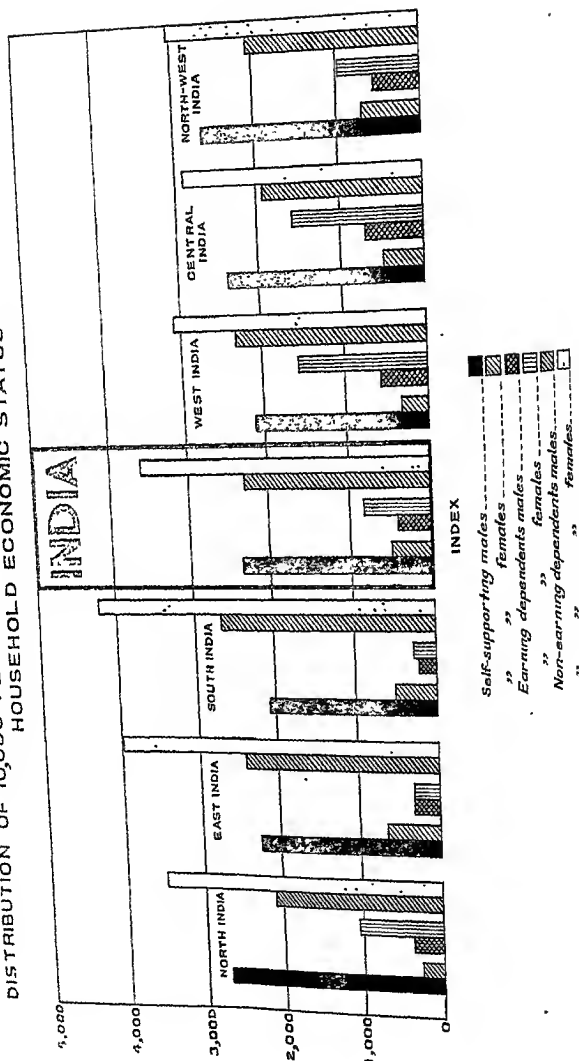
Sex and Household Economic Status

DISTRIBUTION OF 10,000 PERSONS BY SEX AND HOUSEHOLD ECONOMIC STATUS



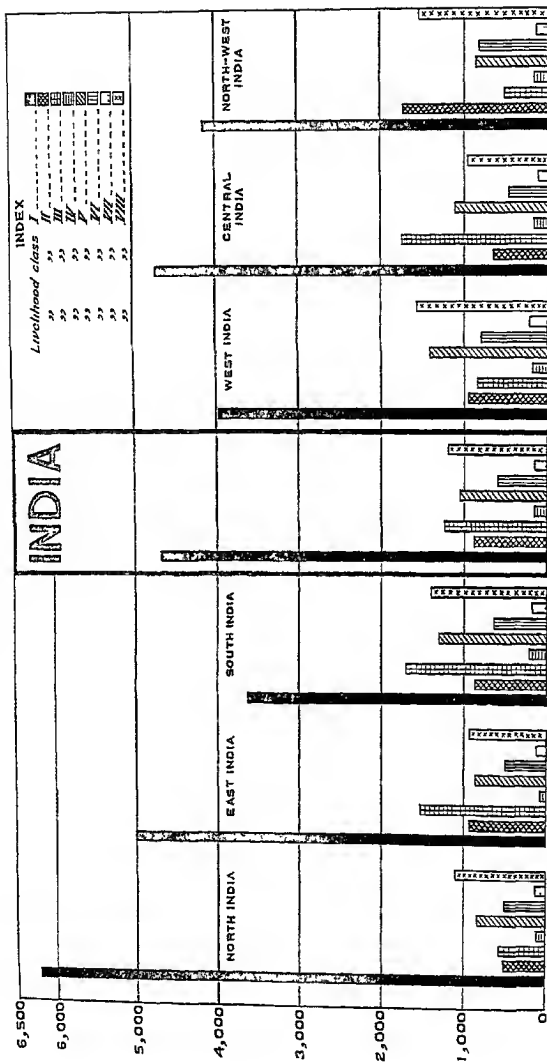
Agricultural Classes
by Sex and Household Economic Status

DISTRIBUTION OF 10,000 PERSONS OF AGRICULTURAL CLASSES BY SEX AND HOUSEHOLD ECONOMIC STATUS



Non-agricultural Classes
by Sex and Household Economic Status

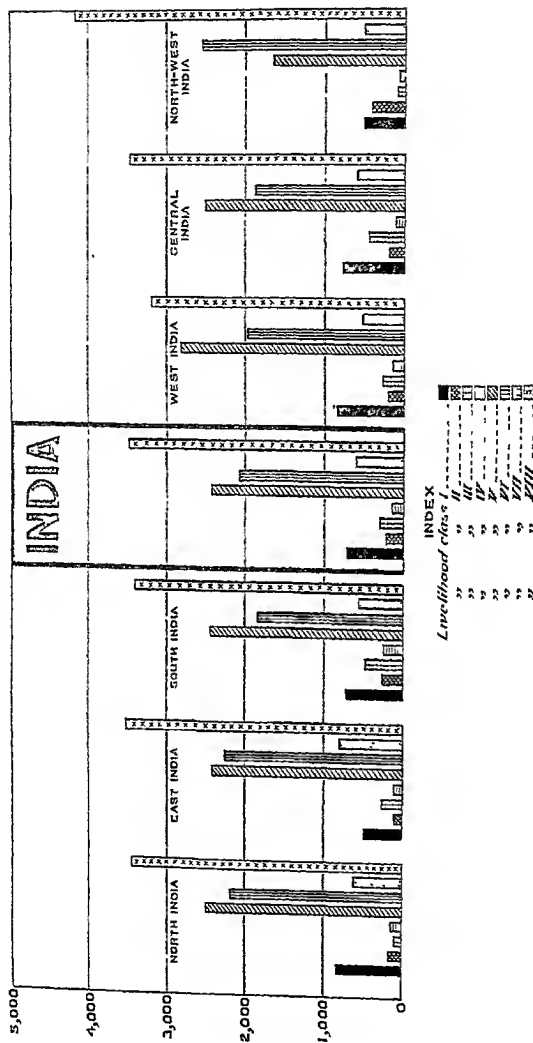
DISTRIBUTION OF 10,000 PERSONS BY LIVELIHOOD CLASSES (INDIA & ZONES)
GENERAL POPULATION



Livelihood Classes — India & Zones — Rural Population

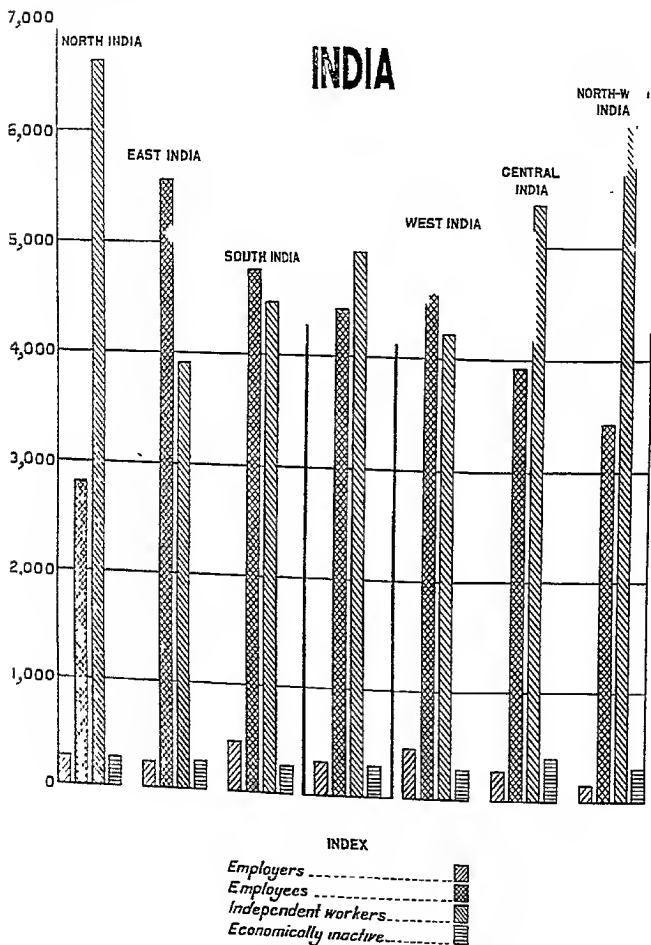
Livelihood Classes — India & Zones — Urban Population

DISTRIBUTION OF 10,000 PERSONS BY LIVELIHOOD CLASSES (INDIA & ZONES)
URBAN POPULATION

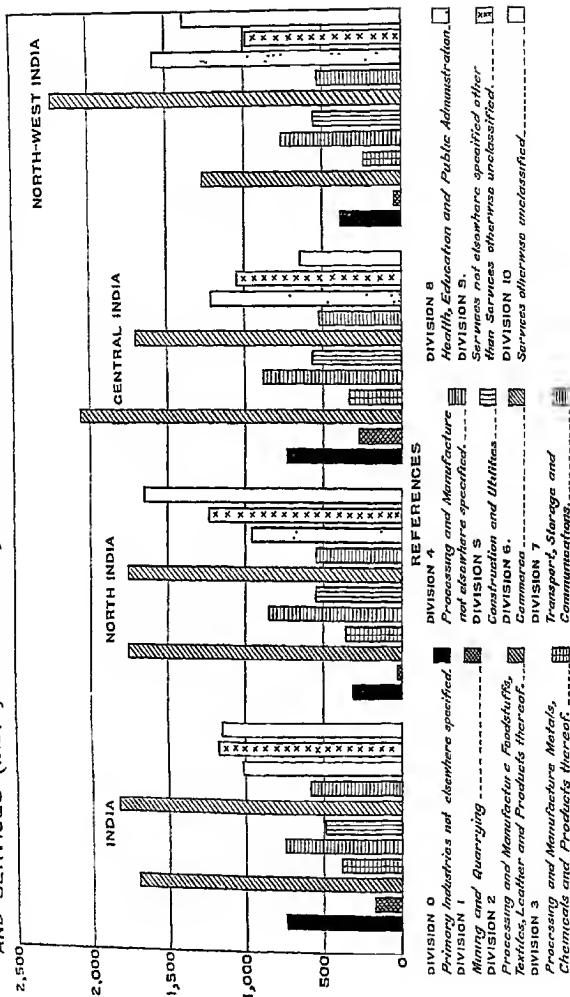


Employers, Employees,
and Self-employed persons (Independent Workers)
and persons not economically active

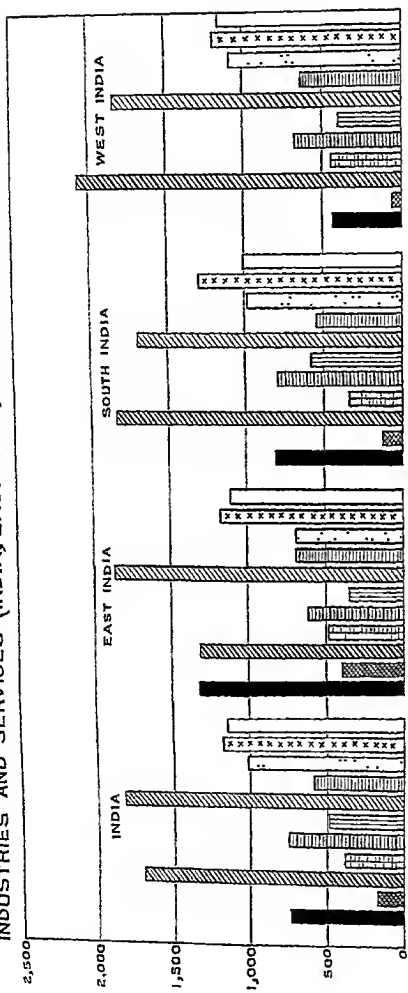
**DISTRIBUTION OF 10,000 SELF-SUPPORTING PERSONS IN
NON-AGRICULTURAL POPULATION BY EMPLOYERS, EMPLOYEES,
INDEPENDENT WORKERS AND PERSONS NOT ECONOMICALLY ACTIVE**



DISTRIBUTION OF 10,000 SELF-SUPPORTING PERSONS OF NON-AGRICULTURAL CLASSES IN INDUSTRIES AND SERVICES BY 10 DIVISIONS OF INDUSTRIES AND SERVICES (INDIA, NORTH INDIA, CENTRAL INDIA AND NORTH-WEST INDIA)



DISTRIBUTION OF 10,000 SELF-SUPPORTING PERSONS OF NON-AGRICULTURAL CLASSES IN INDUSTRIES AND SERVICES BY 10 DIVISIONS OF INDUSTRIES AND SERVICES (INDIA, EAST INDIA, SOUTH INDIA AND WEST INDIA)



- DIVISION 0.** Primary Industries not elsewhere specified.
- DIVISION 1.** Mining and Quarrying
- DIVISION 2.** Processing and Manufacture of Foodstuffs, Textiles, Leather and Products thereof
- DIVISION 3.** Processing and Manufacture of Metals, Chemicals and Products thereof
- DIVISION 4.** Processing and Manufacture not elsewhere specified
- DIVISION 5.** Construction and Utilities
- DIVISION 6.** Commerce
- DIVISION 7.** Transport, Storage and Communications
- DIVISION 8.** Health, Education and Public Administration
- DIVISION 9.** Services not elsewhere specified other than Services otherwise unclassified
- DIVISION 10.** Services otherwise unclassified

CHAPTER III

Livelihood Pattern—1951

A — *India Picture*

EVERY HOUSEHOLD needs a steady supply of staple foodgrains and a few other foodstuffs. This is needed every day, day after day, all the year round ; otherwise the people cannot live.

A few other goods are almost equally indispensable—fuel to cook the foodstuffs, cloth, and so on. After this, there is a considerable variety. Some families get and use a great many goods and services ; others manage with very little.

All these goods and services may be described as 'means of living'. Some families get the greater part of their 'means of living' directly—when they cultivate the land and grow their own food. Even they have to get an income in the form of money in order to buy the other 'means of living'. Families which do not grow their own food, get income wholly in money which they use to buy all their 'means of living'. We use the term 'livelihood' to mean both types of income—in kind as well as in money.

A few families (much fewer than is supposed) get their 'livelihood' without any one having to work for it. Subject to this exception, one or two or more people in every family have got to do some work or other in order to earn the livelihood needed by the family. We use the expression '*Means of Livelihood*' to mean the work, by which livelihood is earned ; and, in the exceptional circumstances where an unearned income is obtained, the nature of such unearned income.

We put questions and ascertained in respect of every man, woman, and child whom we counted, what his or her 'means of livelihood' was. The records containing this information for about 3 lakhs of people in the Punjab were destroyed by fire. About the rest—numbering 3,566 lakhs—we have got a complete account. The information has been sorted and compiled into Economic Tables. The Economic Tables of the 1951 Census show—for the country as a whole, for each state, natural division, district and the different parts of the district—

CHAPTER III: LIVELIHOOD PATTERN—1951

how many people there are who obtain their livelihood in one or other of several different ways all of which are classified on an identical basis throughout the country. By grouping the people in this way according to their means of livelihood we get categories, classes, sub-classes, sections, divisions and sub-divisions. This is a complete economic classification of the people. A full explanation of the definitions and classifications will be found in APPENDIX III. This paper also contains a detailed review of the data, together with a discussion of possible errors and defects in them. In this chapter, a brief account is given in simple terms without entering into unduly technical discussions

2. *Non-earning dependants*—Out of the total of 3,566 lakhs, 2,143 lakhs of people (or 60·1 per cent) have been classified as ‘non-earning dependants’.

TABLE I

	Non-earning dependants	
	Number (IN LAKHS)	Percentage
Rural males . .	674	45·0
Urban males . .	152	45·6
Rural females . .	1,065	73·5
Urban females . .	252	88·1
TOTAL . .	2,143	60·1

They do not take any part in procuring their own livelihood. In the main, they consist of women and children who are supported by the husband and father or other bread-winner of the household. They do not, however, include those women and children who take part in the cultivation of land as unpaid family helpers. TABLE I shows the rural/urban and sex-wise break-up of non-earning dependants. The percentages are such as might be expected.

Non-earning dependency among females must naturally be substantially higher than among males. It is higher among urban females than among rural females mainly because the latter lend a hand in cultivation while the former do not have that opportunity. Non-earning dependency is a shade higher among urban males than among rural males. It may or may not be significant.

3. *Earning dependants*—There are 379 lakhs of people (or 10·6 per cent of the total number) who are classified as ‘earning dependants’. They are dependants in the sense that—left to themselves—they cannot support themselves. They are also, in the main, women or grown-up children, but they are not ‘non-earning dependants’, either because they earn some income which is sufficient to meet part of the cost of their maintenance or else they are unpaid family helpers in cultivation (or other business, like handloom weaving for

instance, by which the livelihood of the family is earned). In the latter case, their participation is so limited that they are not regarded as earning the full cost of their maintenance thereby. If, however, they take a more effective part they would not be classified as 'earning dependants', but as 'self-supporting persons'.

TABLE 2 shows the rural/urban and sex-wise break-up of 'earning dependants'. These figures show that 'earning dependants' are relatively

TABLE 2

—	Earning dependants	
	Number (IN LAKHS)	Percentage
Rural males . .	119	7.9
Urban males . .	15	4.6
Rural females . .	232	16.0
Urban females . .	13	4.5
TOTAL . .	379	10.6

unimportant in towns—both in absolute number and percentage. This is true of both males and females. It is in villages, and more especially among village women, that considerable numbers are found, and the work of earning dependants makes a significant contribution to the procurement of the livelihood of the family.

4 *Self-supporting persons*—Every one who is not a dependant is classified as a 'self-supporting person' which means : he (or she) procures an income which is at least sufficient for his (or her) own maintenance. As the entire cost of maintenance of non-earning dependants and part of the cost of maintaining earning dependants has to be met by self-supporting persons, it is evident that most of them procure an income which is substantially in excess of the actual cost of their own maintenance.

There are, in all, 1,044 lakhs of self-supporting persons, or 29.3 per cent of the total number. TABLE 3 shows the rural/urban and sex-wise break-up

TABLE 3

—	Self-supporting persons	
	Number (IN LAKHS)	Percentage
Rural males . .	706	47.1
Urban males . .	166	49.8
Rural females . .	151	10.4
Urban females . .	21	7.4
TOTAL . .	1,044	29.3

of these 1,044 lakhs. On the whole, women number rather less than one in six among all self-supporting persons. In villages they are more than one in six, but less than one in five. In the towns, they are nearer one in eight.

We may, for the present, leave the dependants out of consideration. We shall return to them at the end of this section. Our

CHAPTER III: LIVELIHOOD PATTERN—1951

immediate purpose is to follow up these 1,044 lakhs of self-supporting persons and ascertain what exactly they do in order to get a living.

5. There is, first, a broad division. Out of 1,044 lakhs, 710 lakhs (or 68·1 per cent) are 'agriculturists'; and 334 lakhs or (31·9 per cent) are 'non-agriculturists'. The distinction between the two is simple. Anyone whose income is derived from the cultivation of land (whether this be in the form of net profits of cultivation, or of wages for employment as cultivating labourer, or of rent received by virtue of vested rights by a non-cultivating land-holder) is classified as an 'agriculturist'. All other self-supporting persons are classified as 'non-agriculturists'. It may happen, of course, that some self-supporting persons may be in receipt of income of two different varieties. In such cases, that income which is the larger of the two is taken into consideration for purposes of classification as agriculturist or non-agriculturist.

The rural/urban and sex-wise break-up of agriculturists and non-agriculturists is shown below:

TABLE 4

		Self-supporting persons			
		Agriculturists		Non-agriculturists	
		Number (IN LAKHS)	Percentage	Number (IN LAKHS)	Percentage
Rural males	. . .	566	80·2	140	19·8
Urban males	. . .	19	11·4	147	88·6
Rural females	. . .	121	80·2	30	19·8
Urban females	. . .	4	19·7	17	80·3
TOTAL	. . .	710	68·1	334	31·9

The figures of this table should help to correct some misconceptions. It is not seldom supposed that 'rural' and 'agricultural' mean more or less the same thing; or that 'urban' and 'non-agricultural' are very nearly identical. This is not correct. Roughly, one among every five self-supporting persons in villages (male as well as female) is a non-agriculturist. Among self-supporting males in towns, one in nine is an agriculturist. The ratio is even higher among self-supporting females, but this is unimportant, because

INDIA PICTURE -

their absolute number is quite small. One might suppose that the agriculturists in towns must be non-cultivating landholders who live on rent. This is not correct. As we shall see presently, the number of agricultural rentiers living in villages as well as towns is a very much smaller fraction of the total number of all agriculturists in the country. Cultivation is carried on in the periphery of all towns. Some cultivators and even cultivating labourers live there. The proportion of such people is very small in the cities and major towns, but is quite considerable in the minor towns and townships.

6. Let us leave the non-agriculturists for a time, and follow up our 710 lakhs of agriculturists. They are divided into four classes as below:

TABLE 5

<i>Livelihood Class</i>	<i>Number (IN LAKHS)</i>	<i>Percentage of all agricul- turists</i>	<i>Percentage of all self- supporting persons</i>
I—Cultivators of land wholly or mainly <i>owned</i>	457	64·4	43·8
II—Cultivators of land wholly or mainly <i>un-owned</i>	88	12·3	8·4
III—Cultivating labourers	149	21·0	14·3
IV—Non-cultivating owners of land, and other agricultural rent receivers	16	2·3	1·6
TOTAL	710	100·0	68·1

The figures of this table bring out clearly the relative numerical importance of the four classes into which agriculturists have been divided.

7. Among the four classes, Livelihood Class IV (whom we shall refer to as 'agricultural rentiers' for short) is numerically insignificant. This class includes two quite different types of people referred to as 'non-cultivating owners of land' and 'other agricultural rent receivers'. In popular imagination, the proprietors of zamindaris and other estates come first. They are the people referred to as 'other agricultural rent receivers'. This is a better description of such people than 'non-cultivating owners of land'—because their legal rights over the whole or greater part of the cultivated land in the estate are strictly limited to the receipt of a rent (which may not be changed except by

prescribed statutory processes). They are disentitled to enter on such lands for purposes of cultivation even if they wanted to. These people are 'agricultural rentiers' by legal prescription, not necessarily by choice. There is another, and clearly distinguishable type of agriculturists who are referred to as 'non-cultivating owners of land'. These are the people referred to as 'raiya' in raiyatwari villages, permanently settled zamindari villages and also other villages under certain varieties of miscellaneous special tenures. There are also the people who are called 'tenants' in temporarily settled zamindari villages and villages under similar tenures—who possess a permanent and heritable right of occupancy in the land held by them for purposes of cultivation. Most of these people may cultivate their own land, in which case they are put in Livelihood Class I. Some of them who, for one reason or another, find it necessary or convenient to entrust the cultivation of their land to others on an undertaking to pay rent, would be agricultural rentiers temporarily, by voluntary decision and not by legal necessity. How many of each of these two types are included in the India total of 16 lakhs is not known definitely. But judging from their territorial distribution, there can be little doubt that the raiyat-tenant type of rentier is much more numerous than the zamindar type.*

All of them, taken together, add up only to 2·3 per cent of all agriculturists and 1·6 per cent of all self-supporting persons.

8 Livelihood Classes I and II comprise all the cultivators. Livelihood Class III includes all the cultivating labourers. It is necessary clearly to grasp the fact that there is a distinction between the two; and appreciate precisely what the distinction is. This point is stressed because there is a great deal of discussion about land reform, and one often finds that the words 'kisan', 'peasant', 'tiller of the soil' and so forth are used, sometimes in a restrictive sense to denote particular groups among agriculturists (often not the same groups) and sometimes the words are used as if they were synonyms for 'agriculturists'. It is so difficult to be sure about what is being proposed or opposed.

The census figures distinguish the 'cultivating labourer' as an employee of a cultivator, whose business merely is to perform physical labour in the manner required by the cultivator. The cultivator is the *manager* of cultivation—he is the person who decides how and when or where the various operations of cultivation should be undertaken, and who sees to it that they are properly undertaken. He is the person who accepts the risks of cultivation. The nature of

* One of the pitfalls for the unwary enquirers about land tenures is the fact the same name means different things in different places and different names mean the same thing. One of these pitfalls is the word 'zamindar'. It stands for someone in the Punjab and an altogether different type of person in Bihar and West Bengal.

the income obtained by these cultivators is quite different from that of the cultivating labourer. The cultivator gets the 'net profits of cultivation,' i.e., what remains of the produce of the land after expenses are met. The cultivating labourer gets 'agricultural wages'. The livelihood of the cultivating labourer is part of the expenses of cultivation.

There are, it will be observed, only 149 lakhs of cultivating labourers against 545 lakhs of cultivators—very little more than one in five. This shows that the number of cultivators who employ cultivating labourers in addition to or in lieu of the labour performed by themselves and members of their families must be relatively small.

9 Having thus distinguished cultivators from cultivating labourers, we make a further distinction among cultivators, one being put in Livelihood Class I and the other in Livelihood Class II. It would be simple and convenient to refer to these two classes as 'owner-cultivators' and 'tenant-cultivators'; but great care was taken to avoid using these expressions at the census enumeration because they were liable to cause misunderstanding of the true nature of the distinction we sought to make. Our idea of 'owner-cultivator' is one which includes the 'occupancy tenants' of Uttar Pradesh along with the 'raiya' of the raiyatwari villages of Bombay and Madras and the 'raiya' of the permanently settled zamindaris of Bihar. They are all 'owner-cultivators'—because the term 'owner' (if it is legitimately applicable to any type of holder of cultivated land) must be applied to that person who has the right to remain in possession of it, use it for cultivation and bequeath it to his heirs for a like purpose. The use of the term 'tenant-cultivator' must be limited to cultivators who hold the land they cultivate, for a strictly limited period, and are not owners thereof in the sense explained above.

There is one more reason why the terms 'owner-cultivator' and 'tenant-cultivator'—though apparently simple and convenient—were not used at the stage of enumeration. It is obviously possible that a person may cultivate at one and the same place some plots of land which are owned by him and other plots which he may have rented from someone else who owns them. In such a case, the test is— which of the two gives him the larger income. If the former, he is included in Livelihood Class I. If the latter, he is included in Livelihood Class II.

Now that we have explained the distinction clearly and there is no danger of the census going wrong because of confusion of local names, we shall refer to Livelihood Class I or 'cultivators of land wholly or mainly owned' as

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owner-cultivators; and Livelihood Class II or 'cultivators of land wholly or mainly *un-owned*' as tenant-cultivators.

There are 545 lakhs of cultivators. Among them, owner-cultivators number 457 lakhs and tenant-cultivators number only 88 lakhs.

The preponderance of 'owner-cultivators' is the most important and characteristic feature of our agricultural-class-structure. As we shall see presently this statement is true not merely of raiyatwari areas but it is true to an even greater extent of the permanently settled and temporarily settled zamindari areas as well.

10. We may now turn to the 334 lakhs of self-supporting non-agriculturists and ascertain the manner in which they obtain their livelihood. They too may be divided into four sections as below :

TABLE 6

	[Number (IN LAKHS)]	Percentage of all self-sup- porting non-agri- culturists	Percentage of all self-sup- porting persons
Employers	11	3.3	1.1
Self-employed persons other than employers	165	49.4	15.7
Employees	148	44.3	14.2
Non-agricultural rentiers, pensioners and miscellaneous income receivers	10	3.0	0.9
TOTAL	334	100.0	31.9

11 The last of the four sections includes a variety of people as shown below:

- (i) Persons living principally on income derived from ownership of non-agricultural property;
- (ii) Persons living principally on pensions, remittances, scholarships and funds;
- (iii) Inmates of jails, asylums, alms-houses and recipients of doles;
- (iv) Beggars and vagrants ; and
- (v) All other persons living principally on income derived from non-productive activity.

INDIA PICTURE

The figures returned under some of these items are surprisingly small. But it should be borne in mind *first*, that the figures relate only to self-supporting persons and do not include their dependants; and *secondly*, that persons whose principal income is derived in some other way, but who may also derive secondary income in one or other of the ways mentioned above are not included.

12. The low ratio of 'employers' stands out. They are only about one in hundred among all self-supporting persons and rather less than one in thirty among all self-supporting non-agriculturists. This is all the more remarkable because the definition of employers was comprehensive and included everyone who employed even one person—provided only that the latter was employed for purposes of carrying on the business or profession by which the employer earned his livelihood [No one was to be classified as an employer merely because he had domestic servants] As this is the first time when statistics of employees, other self-employed persons and employers were collected, it is impossible to compare them with previous figures. There is no good reason to suppose that any appreciable number of employers were wrongly included in any of the other sections.

13. Non-agricultural employees, it will be observed, form a distinctly larger proportion of non-agriculturists than cultivating labourers among agriculturists. They are nevertheless a clear minority. Self-employed persons (other than employers) are, on the other hand, more numerous than employers and employees combined.

If we deduct rentiers from both sides (16 lakhs from agriculturists and 10 lakhs from non-agriculturists), we get the following classification of income-earners with reference to the nature of the income earned by them:

TABLE 7

Nature of Income	Number (IN LAKHS) of Income earners		
	Cultivation	Industries and services	Total
Net profits	545	176	721
Wages and salaries	149	148	297
TOTAL	694	324	1,018

Earners of profits—it may be noted—are much more than twice as numerous as earners of wages and salaries *

* Hence, no doubt, the tears over any sustained effort to keep commodity prices under control!

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14 We may now follow up our 324 lakhs of self-supporting persons engaged in industries and services other than cultivation and ascertain what exactly they do in order to earn their income. All industries and services other than cultivation have been grouped together into 10 divisions, and 88 sub-divisions. Any grouping system is bound to appear somewhat arbitrary—but the system we are following has been carefully drawn up so as to satisfy two requirements as far as practicable. One is, that our statistics should be comparable with those collected in other countries under a scheme approved by the United Nations Economic and Social Council. The other requirement is, that the 1951 Census statistics should be comparable with the published statistics of the 1931 and earlier censuses in India. The results of classification of the 324 lakhs of persons referred to above are shown in the table below :

TABLE 8

<i>Division of Industries and Services</i>	<i>Number (IN LAKHS) Percentage</i>	
Division 0		
Primary industries other than cultivation, mining and quarrying	24.0	7.4
Division 1		
Mining and quarrying	5.7	1.8
Division 2		
Processing and manufacture— foodstuffs, textiles, leather and products thereof	55.1	17.0
Division 3		
Processing and manufacture— metals, chemicals and products thereof	12.4	3.8
Division 4		
Processing and manufacture not elsewhere specified	24.3	7.5
Division 5		
Construction and utilities	15.9	4.9
Division 6		
Commerce	59.0	18.2
Division 7		
Transport, storage and communications	19.0	5.9
Division 8		
Health, education and public administration	32.9	10.2
Division 9		
Services not elsewhere specified	75.4	23.3
TOTAL	323.7	100.0

We may now look into each of these divisions briefly, to see what sort of activities are included in each and their relative numerical importance

15. PRIMARY PRODUCTION—*Divisions 0 and 1*—The people who work on the land and produce food and all the raw materials of industries are 'primary producers'. By far the most important among them are those who work on cultivated land and produce field crops. We have seen already that their total number is 694 lakhs. The other primary producers number only 30 lakhs—though two separate divisions have been allotted for their classification

Plantation industries—This is the most important sub-division in Division 0. It accounts for 10.6 lakhs of people (or 44.2 per cent of this division) and includes all the workers in tea, coffee and rubber plantations (and in fact, all other kinds of plantations except the cultivation of such crops as sugarcane or betel, undertaken in conjunction with ordinary cultivation of field crops)

Stock-raising—This sub-division accounts for 6.3 lakhs of people (or 26.3 per cent of this division). It includes all herdsmen and shepherds and those who breed or maintain herds of cattle, buffaloes and other large animals as their principal means of livelihood. [The ordinary cultivator who makes a little extra income by cattle-breeding is not, however, included here but shown under Livelihood Class I or II.]

Fishing—This sub-division accounts for 4.2 lakhs of people (or 17.5 per cent of Division 0).

Forestry, woodcutting and collection of forest produce not elsewhere specified—This accounts for 2.5 lakhs of people (or 10.5 per cent of this division).

A separate sub-division was provided for 'rearing of small animals and insects'. This was intended to include poultry farmers, bee-keepers, silkworm rearers, cultivators of lac and so on. But the number returned was extremely small (only 27 thousand for the whole country). The reason, no doubt, was that such activities provide only a 'secondary' means of livelihood. Another sub-division—provided for 'hunting'—also yielded an even smaller number (under 9 thousand).

MINING AND QUARRYING—It is extraordinary how small a number of people are engaged on 'mining and quarrying' over an entire sub-continent. There is little doubt that the figures are substantially correct. They reflect the relative scarcity of known deposits of profitably workable minerals over a very large part of the country, as well as the insufficiency of organised enterprises in the few localities where there is no such scarcity.

Coal mining is by far the most important sub-division within this division. It accounts for 3.1 lakhs of people or 54.9 per cent of all persons engaged in mining and quarrying.

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mining and quarrying An estimate of the relative money value of raw mineral output (which will be found among the papers in APPENDIX I) represents the money value of coal as being 58.9 per cent of the money value of all mineral production in India.

Extraction from the earth of stone, clay, sand and other materials used in building or manufacture of cement, engaged 1.2 lakhs of people (or 21.5 per cent of this division).

Other kinds of mining and quarrying provide gainful employment as shown in the table below :

TABLE 9

Group	Number (IN THOUSANDS)
Iron ore	9
Metals other than iron ore	57
Petroleum	3
Mica	33
Salt, saltpetre and salme sub- stances	22
Non-metallic minerals not other- wise specified	11
TOTAL	135

This concludes our account of 30 lakhs of workers, engaged in primary production, other than cultivation of land.

16. PROCESSING AND MANUFACTURE—The workers in *Divisions 2, 3 and 4*—all engaged in 'processing and manufacture'—number 92 lakhs. Three out of every five persons among them are engaged in processing the primary products of cultivation and animal husbandry. All of them are included in Division 2 which accounts for 55 lakhs and is

divided into various sub-divisions as explained below:

Grains and pulses—Milling of cereals and pulses, hand-pounding of rice, manual dehussing and flour grinding, grain parching and similar processing of grains and pulses employ 4.0 lakhs of persons—of whom about half are women and a little under three quarters are living in villages.

Vegetable oil and dairy products—There were 2.7 lakhs of people mostly males and mainly self-employed. About one lakh live in towns and the rest in villages.

Sugar industries—They provide a living for 1.4 lakhs of people, mostly males. About one-third among them are self-employed and two-thirds are employees. About two-thirds live in villages and one-third in towns.

Beverages—The sub-division includes brewers and distillers, toddy drawers and people who make aerated and mineral waters and ice. They number 1.6

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lakhs— mostly males and mainly self-employed, and a very large proportion live in villages. The number counted in towns was only 33 thousands.

Tobacco— The sub-division includes— not the growers of tobacco (who are counted among cultivators), but— those who prepare raw leaf tobacco for manufacturing, as also makers of *bidis*, cigarettes, cigars, cheroots and snuff. They number 3·6 lakhs— about five-sixths males, and nearly two lakhs live in towns. 1·5 lakhs only are employees— the others are self-employed.

Other food industries account for 1·8 lakhs— mostly males and mainly self-employed. Roughly a lakh live in towns.

All food industries— Altogether, therefore, we have apart from the cultivators who work in the fields and the housewives who mostly cook and serve the food, (and not counting the people working in hotels and eating-houses as well as cooks employed as domestic servants)— a total of 15 lakhs of people who earn their living by processing the food, drink and tobacco consumed by other people.

Cotton textiles— This important sub-division includes cotton ginning, cleaning and pressing; spinning, sizing and weaving; dyeing, bleaching and printing. 20·6 lakhs* of people earn a living from this industry, which means one out of every 16 persons engaged in all industries and services other than cultivation. Women workers are relatively small in number (2·3 lakhs). Nearly 12 lakhs live in towns and 9 lakhs in villages. The self-employed workers number nearly 13 lakhs and are more numerous than employees. Most of the former must be handloom weavers and most of the latter must be factory workers.

Wearing apparel (except footwear) and made-up textile goods— All tailors and dressmakers, makers of hosiery and embroiderers are included in this sub-division which accounts for 6·5 lakhs— mostly males, mostly self-employed and rather more numerous in towns than in villages.

Other textiles— There is another sub-division which includes all textile industries other than the two mentioned above. This includes pressing, bailing, spinning and weaving of jute as well as spinning and weaving of wool, silk, hemp and flax. It includes rayon manufacture; it also includes manufacture of rope, twine, string and similar goods made from cocoanut aloes, straw, linseed and hair.

* These numbers might excite surprise and be regarded as too small. It should be remembered that we are analysing the numbers of self-supporting persons only, unpaid family helpers and part time workers whose principal income is derived from some other source are not included in this number. For a fuller statement on this point, reference may be made to the note printed as Part D of APPENDIX III.

The total number under all these heads is only 7·1 lakhs of which 1·6 lakhs are females. The total number is almost equally divided between villages and towns—women workers in villages being twice as numerous as in towns. Employees predominate (numbering 4·6 lakhs)

Leather, leather products, and footwear account for 5·8 lakhs, mostly males and mostly self-employed. They live mainly in villages (the number living in towns being only 1·9 lakhs)

Metals and chemicals—We have now finished the industries which use the products of cultivation and animal husbandry as their raw material. The second of the three divisions of industries which process and manufacture goods, consists of all those which are based on metals and chemicals. Division 3 had been provided for numbering them; but the total number in these industries is only 12·4 lakhs. Female workers are about half-a-lakh only. There are 7·8 lakhs in towns and 4·6 lakhs in villages. Employees predominate, numbering 6·9 lakhs. A series of sub-divisions which are very important in other countries had been provided but very few numbers turned up; the sub-divisions with over a lakh were—manufacture of transport equipment (2·2 lakhs), machinery (other than electrical machinery) including engineering workshops (1·2 lakhs), basic manufacture of iron and steel (1·1 lakh) and the residuary sub-division, manufacture of metal products otherwise unclassified (6·2 lakhs*).

Other manufacturing industries—This is Division 4, which accounts for 24·3 lakhs. The most important sub-division is the manufacture of wood and wood products (10·4 lakhs). Carpenters, turners, joiners and basket-makers account for practically the whole of this number. Another important sub-division proved to be the manufacture of non-metallic mineral products (4·5 lakhs). This means mainly potters and includes makers of all earthenware, porcelain, crockery, glass, glass bangles and glass beads etc. Out of the total of 24·3 lakhs of workers in this division as many as 17·3 lakhs were self-employed persons and 15·1 lakhs lived in villages. Female workers numbered less than one in ten.

This concludes our account of the 92 lakhs of self-supporting persons who make their living out of processing and manufacture.

17 *COMMERCE*—We may next consider 'Commerce'—*Division 6*—which provides a living for 59 lakhs of workers, including 5·6 lakhs of female workers. Less than a fifth among them are employees (11·3 lakhs). Others are self-

* 11·3 lakhs are employees, 11·3 lakhs are self-employed, and other workers in iron, and makers of implements

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employed. They are more numerous in towns (34·8 lakhs) than in villages (24·2 lakhs). They fall into three distinct groups as shown in TABLE 10.

TABLE 10

—	Number (IN LAKHS)
Retail trade . . .	51·1
Wholesale trade . . .	4·6
Money-lending, banking, insurance and real estate . . .	3·3
TOTAL . . .	59·0

Among the 51 lakhs engaged in retail trade, a little less than one-half (22·5 lakhs) are engaged in selling foodstuffs including drink and tobacco ; 1·9 lakhs sell fuel and 5·6 lakhs sell textiles and leather goods. The goods sold by 21 lakhs are unclassified. A great many among them are likely to be selling such a jumble of varied commodities that they are not probably classifiable.

We have already observed that much the greater number of those engaged in processing and manufacturing industries were processing the products of cultivation and animal husbandry. It is now seen that the same is true of retail trade.

18. CONSTRUCTION AND UTILITIES— *Division 5*— This accounts for 15·9 lakhs including 2·7 lakhs of female workers in villages and towns [Whereas the numbers are about equal in villages and towns, it should be borne in mind that the proportion of rural workers to the rural population will be very much smaller than the proportion of urban workers to the urban population, as the rural population is about five times as numerous as the urban population] The self-employed persons number 8·4 lakhs while employees are 7·1 lakhs. This division includes all workers engaged in the maintenance as well as new construction of buildings, roads, bridges, rail-roads, telegraph and telephone lines, irrigation and other agricultural works. It also includes people employed on works and services which provide electric power and gas supply, domestic and industrial water supply and sanitary works and services. A difficult (and rather doubtful) decision on classification has brought scavengers under the last mentioned sub-division of this division.

19 TRANSPORT, STORAGE AND COMMUNICATIONS— *Division 7*— The total number in this division is 19·0 lakhs. Female workers are negligible in number— only 63 thousand. The number living in villages (5·9 lakhs) is less than a third of the total. Employees predominate.

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Among the sub-divisions, 'transport by road' comes first with 8·9 lakhs, then 'Railway transport' with 5·7 lakhs and 'transport by water' with 2·2 lakhs. A very small number (13 thousand only) appears under transport by air. [It should be mentioned here that the number under 'railway transport' would not be exactly the same as the number employed by all the Railways of India, for workshop personnel and those who make and maintain the permanent ways and bridges will appear under separate divisions provided for manufacture, construction etc. The same applies to persons engaged in the Post and Telegraph Services] Though a whole sub-division has been provided in order to secure international comparability of data relating to 'storage and warehousing' the number recorded under it is insignificant—less than ten thousand

20. HEALTH, EDUCATION AND PUBLIC ADMINISTRATION—*Division 8*— This division accounts for 32·9 lakhs of people—or one in ten among all non-agriculturists. Female workers number 2·7 lakhs, self-employed workers number 2·4 lakhs. As may be expected, most persons in this division are employees, 20·7 lakhs live in towns, while 12·2 lakhs live in villages.

Medical and other health services claim 3·8 lakhs made up of 2·3 lakhs living in towns and 1·5 lakhs living in villages. Not all of them, of course, are doctors—for all engaged in these services are counted. A special count by groups within this sub-division (which is somewhat incomplete*) shows the following results:

TABLE II

Group	Number
Registered medical practitioners	91,930
Vaid, hakims and other persons practising medicine without being registered	96,147
Compounders	38,407
Nurses	31,517
Midwives	23,938
Vaccinators	5,928
Dentists	3,283
All other persons employed in hospitals or other private establishments rendering medical or other health services, but not including scavengers or other sanitary staff	72,970

*The figures exclude the numbers in the following districts of Bihar—Monghyr, Bhagalpur, Saharsa, Patna and Santhal Parganas

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'Educational services and research' employ 7·4 lakhs of people, almost equally divided between towns and villages. Roughly one in six (1·2 lakhs) are female workers. A special count (which is somewhat incomplete*) showed 99,256 professors, lecturers, teachers and research workers employed in universities, colleges and research institutions; while all other professors, lecturers and teachers numbered 549,544.

Those classified as being engaged in 'public administration' number 21·6 lakhs. If we exclude about 9 thousand persons recorded as being employed by Non-Indian Governments, we have the following account for 21·5 lakhs of people :

TABLE 12

<i>Group</i>	<i>Number (IN THOUSANDS)</i>
Employees of the Central Government	503
Employees of State Governments	1,426
General administration	809
Police (other than village watchmen)	380
Village establishments including village watchmen	237
Employees of District Boards, Municipalities and other local bodies	224
TOTAL	2,153

It should be explained that 'public administration' is a residuary classification in the sense that it excludes employees of Governments, municipalities and local bodies who are classifiable under any other specific service sub-division. Thus doctors, compounders, nurses and midwives are classified under one sub-division 'medical and other health services', whether or not they are government employees. Likewise, in 'educational services and research'. Station masters and engine-drivers come under the sub-division 'railway transport', and not 'public administration'. Similarly for the postal and telegraph services. The public works staff go under 'construction'; and the workers in Sindri or in other Government-owned industrial enterprises come under the appropriate sub-division for processing and manufacture. Who remain?

*See footnote on page 104

These are the people employed by Governments, municipalities and local bodies who are engaged in (i) the administration of law and justice; (ii) the defence of the country; (iii) the maintenance of watch and ward and the security of person and property of the people; (iv) the assessment and collection of public revenue, management of public funds and public property; (v) the general management, control, and co-ordination of the activities of varied groups of establishments maintained by the Governments for rendering specific services to the people (health, education, transport, communication, etc.); and (vi) the rendering of personal staff assistance to those who actually govern the country and make its laws

21. SERVICES NOT ELSEWHERE SPECIFIED — *Division 9*—The number of persons recorded under this residuary division, is 75.4 lakhs including 14.5 lakhs of female workers. 34.5 lakhs are employees. Forty-one lakhs live in villages. As many as 37.3 lakhs among them are people about whom nothing more is known than that they are self-supporting and earn their living by rendering some service or other. Fifteen lakhs among them are also known to have described themselves as 'employees' and the others as 'self-employed persons'. In some of these cases, it may be that the nature of their activity is clearly specifiable but has been left unspecified either inadvertently or unavoidably. [Special efforts were made to reduce the number of such cases.] In a large proportion of such cases, however, it might well be that they are people who are not conveniently classifiable and are multi-purpose workers in a very genuine sense. There are 8.0 lakhs of these people who have described themselves as employees and who live in villages. It is not impossible that some of them are employed as cultivating labourers and failed to be recorded under Livelihood Class III (which includes 149 lakhs of people). More probably, their participation in agricultural labour is not sufficiently regular or important and so they were rightly excluded from Livelihood Class III. It is, in any case, worth bearing in mind that there are 8.0 lakhs of employees and 14.5 lakhs of self-employed persons living in villages about whom we know only that they earn their living by work, but we do not know what work they do.

Turning to the 38.1 lakhs of people for whom details are available, they are shown in TABLE 13 on opposite page, by sub-divisions in the order of numerical importance.

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TABLE 13

Group	Number (IN THOUSANDS)
Domestic services	1,424
Laundries and laundry services	565
Barbers and beauty shops	511
Religious, charitable and welfare services	369
Legal and business services	230
Recreation services	214
Hotels, restaurants and eating-houses	458
Arts, letters and journalism	39
TOTAL	3,810

22. *Affiliation of dependants to self-supporting persons by means of livelihood*— We noted at the beginning of this chapter that within the total of 3,566 lakhs of people who were to be classified according to their means of livelihood, there were 2,143 lakhs of people classed as 'non-earning dependants' and another 379 lakhs of people classed as 'earning dependants'. We have seen in detail, the nature of the activities by which the remaining number— *viz.*, 1,044 lakhs of self-supporting persons— earned their living and maintained themselves as well as others who depended on them for maintenance. It is important that we should know not only how many self-supporting persons there are who earn a living from agriculture or from different branches of industries and services, but how many people in all are supported— including in this reckoning not only the self-supporting persons but also their dependants. Such affiliation of dependants to self-supporting persons by means of livelihood could not be carried out in great detail, owing to the time and cost involved, but has been done under eight different heads— called '*Livelihood Classes*' as shown in TABLE 14 on next page.

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TABLE 14

Livelihood Class	Self-supporting persons	Dependants		Total	Percentage to general population (including dependents)
		non-earning	+ earning		
		(NUMBER IN LAKHS)			
I . . .	457	1,001	+ 215	1,673	46.9
II	88	189	+ 39	316	8.8
III	149	247	+ 52	448	12.6
IV	16	33	+ 4	53	1.5
TOTAL—AGRICULTURAL CLASSES	710	1,470	+ 310	2,490	69.8
V	122	223	+ 32	377	10.5
VI	59	145	+ 9	213	6.0
VII	17	37	+ 2	56	1.6
VIII	136	268	+ 26	430	12.1
TOTAL—NON-AGRICULTURAL CLASSES	334	673	+ 69	1,076	30.2
GENERAL POPULATION	1,044	2,143	+ 379	3,566	100.0

Earlier in this chapter, we have already seen who Livelihood Classes I to IV are. Briefly, they are the 'owner-cultivators', 'tenant-cultivators', 'cultivating labourers' and 'agricultural rentiers' respectively. The figures in the table show the self-supporting persons of these classes, along with the dependent members of their households.

Livelihood Class V stands for all persons engaged in non-agricultural 'production' (that is, Divisions 0, 1, 2, 3 and 4) together with their dependants. Livelihood Class VI stands for people engaged in 'commerce' (Division 6) and their dependants. Livelihood Class VII stands for 'transport' (a part of Division 7) and their dependants. Livelihood Class VIII stands for all others.

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including non-agricultural rentiers, pensioners and other miscellaneous income recipients.

23. It will be observed that the percentages of agriculturists and non-agriculturists were found to be 68·1 and 31·9 when we were considering self-supporting persons only (*see paras 5 to 7*); but they turned out to be 69·8 and 30·2, when we considered dependants and self-supporting persons together. The figures show that agriculture supports a slightly larger proportion of people than it provides self-supporting employment for. Why this difference? It is to be expected, because the number of dependants supported by a given number of self-supporting persons is not exactly the same in all livelihood classes. The relevant numbers are computed and shown below :

TABLE 15

Livelihood Class	Number of dependants supported by 100 self-supporting persons		
	Non-earning dependants	Earning dependants	Total
I	219	47	266
II	215	44	259
III	166	35	201
IV	206	25	231
TOTAL—AGRICULTURAL CLASSES	207	44	251
V	185	26	211
VI	246	15	261
VII	218	12	230
VIII	197	19	216
TOTAL—NON-AGRICULTURAL CLASSES	201	21	222
GENERAL POPULATION	205	37	242

24. There are interesting variations both in the total number of dependants, as well as in the break up of this number between non-earning dependants and earning dependants. The low figures for cultivating labourers (Livelihood Class III) and the high figures for 'commerce' (Livelihood Class VI) stand out. They suggest the presence of significant variations among different social groups.

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It is probable that cultivating labourers have, in fact, the higher percentage of family members engaged in earning and living. It is possible that there are groups with even higher ratios of dependants to self-supporting persons than in 'commerce'. We might find them, if we could isolate specific professional service groups merged within Livelihood Class VIII.* The broad position is clear. *The average self-supporting person uses his income to support himself and at least two others. Roughly one among three self-supporting persons also provides, in addition, partial support for one earning dependant.*

B — Zonal Variations

FIGURES similar to those set out in the last section for India have been compiled for every zone, every state, every natural division and every district in each state, and for different rural tracts and urban tracts separately within each district. The totals for each of the eight livelihood classes are, indeed, furnished for every single village, and every town, and every ward (or *mohallah*) of every town separately. A review of these figures and comments on their significance will be found for each state in each state census report.

A review for India has also been prepared and printed separately (APPENDIX III). The principal object of this review is to furnish a full account of the definitions and classifications adopted at this census, to compare them with those adopted at previous censuses and to bring out the differences and similarities clearly so that users of census data may be able to study them in relation to the data provided by prior censuses or by other sources. The review also sets out the results of a preliminary study of similarities and differences between different zones of India and also between India in 1951 and India in 1931. The main results of comparison between different zones are briefly set out in this section. The results of comparison between 1951 and 1931 will be referred to in the next chapter.

26. We have seen that there is a three-fold division among the people—self-supporting persons (29·3 per cent), earning dependants (40·3 per cent), and non-earning dependants (30·4 per cent).

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and non-earning dependants (60·1 per cent). The percentages relate to the country as a whole. How they differ among the zones is shown below :

TABLE 16

Zone	Percentage to general population		
	Self-supporting persons	Earning dependants	Non-earning dependants
North India	30·5	12·0	57·5
East India	30·8	6·0	63·2
South India	26·5	4·9	68·6
West India	26·9	15·8	57·3
Central India	29·1	20·0	50·9
North-West India	32·3	12·6	55·1
INDIA	29·3	10·6	60·1

If we run our eyes down the column showing the percentages of self-supporting persons we might be inclined to say that North-West India stands first from the point of view of provision of gainful employment and South India comes last; and the order among the other zones is : East India, North India, Central India and West India. The differences are not very large—three per cent on either side of the all-India average covers all the zones.

If, for the same purpose, we follow the ascending order of percentages of the 'non-earning dependants' we get South India last again; but the first place is taken by Central India instead of North-West India. The order among intermediate zones also alters and we have North-West India, West India, North India and, after a long interval, East India. The quantitative differences between the zones are larger—we need about 9 per cent on either side of the all-India average to cover all the zones.

The difference in results between the two approaches is caused by wide variations in the percentage of earning dependants. Here again, we find South India to be the last in order. Central India comes first. One is nearly one-half and the other is nearly double the all-India average.

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These differences between one zone and another cannot be attributed to corresponding differences in age structure. For the latter differences are far too small. Judged by age structure alone, South India should head the list instead of being at the bottom.

27. When we analyse the figures separately for men and women and for villages and towns, we find that the largest amount of variations occur in the classification of village women. This is seen from the table below :

TABLE 17

Zone	Percentage of rural females who are either self-supporting persons or earning dependants	Ratio between self-supporting persons and earning dependants among 100 rural females who are either self-supporting persons or earning dependants	
		Self-supporting persons Earning dependants	
North India	26.7	24	76
East India	20.5	68	32
South India	16.2	64	36
West India	36.5	18	82
Central India	40.9	23	77
North-West India	33.6	41	59
INDIA	26.5	39	61

The six zones, it may be observed, fall into three pairs—each presenting a pattern of its own.

East India and South India have the smallest ratios of village women who go out for field work or otherwise take some part in earning a livelihood for the family—the number is one in six in one case, and one in five in the other. It so happens that it is precisely in these two zones that the work of the women is rated high. Among the few who do work, the number classified as self-supporting is twice as numerous as the number classified as earning dependants.

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Central India and West India are the two zones where the exact opposite is observed. We have the highest ratios (roughly four out of ten in one case and four out of eleven in another) of women who go out for field work or otherwise take some part in earning a livelihood for the family. But at the same time they are also the two zones where the contribution of women labour is rated lowest. Among these women, earning dependants are twice as numerous as self-supporting women in one zone and four times as numerous in the other.

The other two zones— North India and North-West India— fall in an intermediate category between these two extremes.

What are we to think of these variations brought to light by the census ? It is probable that it is in fact a correct picture of how livelihood is earned and people are supported in different parts of the country. There are, apparently, substantial differences in the volume and nature of participation of village women in livelihood earning. The differences do probably reflect corresponding differences in conditions under which cultivation is carried on as well as differences in social habits and customs. At the same time, it would not be safe to go further than that and maintain that the differences in the figures between different zones have been accurately measured by the figures obtained. It would be unsafe to dogmatise on this point because— simple as it may sound— there are real difficulties in securing that the line between self-supporting persons and earning dependants is drawn at an identical level in all parts of a large sub-continent.

28. To what extent do the different zones differ from one another in the extent to which gainful employment is actually available ? If we are to answer this question satisfactorily we should do two things .

First,— We must leave the women out of the reckoning. Village women present a special problem of evaluation of their work, while women in towns play such a small part that they can be conveniently omitted along with village women

Secondly,— We should have a rough and ready method by which earning dependants may be reckoned as a definite fraction of self-supporting persons and then combined in a single category of 'bread-winners'.

Based on these ideas, we arrive at 'male bread-winner percentages' for the villages and towns of each zone separately (as the percentage of self-supporting

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persons *plus one-third* of the percentage of earning dependants) The results are shown in the table below .

TABLE 18

Zone	Male bread-winner percentages	
	Villages	Towns
North India	55	53
East India	48	56
South India	44	46
West India	47	52
Central India	53	51
North-West India	54	51
INDIA	50	52

The figures lead to the following conclusions as regards actual availability of gainful employment for males :

First,— MALE EMPLOYMENT IN VILLAGES : North India stands first, followed closely by North-West India and Central India. East India and West India come next with a definitely lower bread-winner percentage South India stands last.

Secondly,— MALE EMPLOYMENT IN TOWNS : East India stands first and South India stands last The other zones have intermediate values for bread-winner percentages They are, however, fairly close to one another. The order is : North India, West India, North-West India and Central India.

Thirdly,— DIFFERENCE BETWEEN VILLAGES AND TOWNS : Towns provide more male employment than villages in the country as a whole and in East India, West India and South India

Villages provide more male employment than towns in North-West India, North India and Central India

29 We have seen that the agricultural classes— that is to say, all the people who are supported by agriculture, including dependants— number 69·8 per cent of the population This percentage also varies from one zone to another East India stands first (75·6 per cent) and West India last (59·7 per cent) The percentages in other zones, in order, are : North India (74·2), Central India (73·2), North-West India (66·0) and South India (64·3).

30 The numerical insignificance of agricultural rentiers and their dependants (Livelihood Class IV) is clearly brought out in all zones In the country as a whole, they are 1·5 per cent of the general population and 2·1 per cent of the agricultural classes According to the latter mode of measurement, agricultural rentiers are fewest (1·1 per cent) in East India— the original home of the

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permanently settled zamindari system. They are 3·3 per cent in South India and West India— the original home of the raiyatwari system. The other zones, in order, are : North India (1·4), Central India (2·3) and North-West India (2·7).

31. Cultivating labourers and their dependants (Livelihood Class III) are 12·6 per cent of the general population and 18·0 per cent of the agricultural classes. On the latter basis, they are fewest in North India (7·7) and most numerous in South India (26·6). The other zones, in order, are : North-West India (8·1), West India (14·1), East India (20·3) and Central India (24·0).

32. Tenant-cultivators and their dependants (Livelihood Class II) are 8·9 per cent of the general population and 12·7 per cent of the agricultural classes. On the latter basis, they are fewest in North India (6·9) and most numerous in West India (16·0). The other zones, in order, are : Central India (9·0), East India (12·4) and South India (13·5). It is not possible to fix the position of North-West India satisfactorily because when the census was taken the proportion was temporarily swollen to the abnormal figure of 26·3 per cent — because of the mass migration which had taken place shortly before. A very large number of displaced persons who have since become (or will shortly become) owner-cultivators are shown as tenant-cultivators because they had not yet been given permanent and heritable rights of occupancy in land.

33. Owner-cultivators and their dependants (Livelihood Class I) are 46·9 per cent of the general population and 67·2 per cent of the agricultural classes. Their preponderance among the agricultural classes is clear in all the zones. The highest percentage occurs in North India (83·9) and the lowest in South India (56·6). The other zones, in order, are quite close to one another— West India (66·6), East India (66·2) and Central India (64·7). North-West India with 63·0 per cent will probably go above all these three, if the temporary and abnormal feature mentioned above is allowed for.

34. In the country as a whole, the relative proportion of cultivators (Livelihood Classes I and II) and cultivating labourers (Livelihood Class III) is of the order of 82 cultivators to 18 cultivating labourers.

This proportion is an important indicator of the structure of agricultural organisation and economic relations.

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HIGH RATIO OF CULTIVATORS TO CULTIVATING LABOURERS

It is found that cultivators are 90 or more and cultivating labourers 10 or less in the following divisions of the country :

<i>North India</i>	. . .	All the divisions of the zone <i>except</i> the Uttar Pradesh Hills and Plateau
<i>East India</i>	. . .	All the six Himalayan divisions, and Chhota Nagpur
<i>South India</i>	. . .	Mysore only
<i>West India</i>	. . .	Bombay-Konkan and Saurashtra
<i>Central India</i>	. . .	Madhya Bharat Plateau only
<i>North-West India</i>	. . .	The two Himalayan divisions, all divisions of Rajasthan <i>except</i> the Rajasthan Plateau, and Ajmer.

LOW RATIO OF CULTIVATORS TO CULTIVATING LABOURERS

Cultivators are 75 or less and cultivating labourers 25 or more in the following divisions of the country :

<i>North India</i>	. . .	None
<i>East India</i>	. . .	North Bihar and South Bihar
<i>South India</i>	. . .	North Madras, South Madras, West Madras and Travancore-Cochin
<i>West India</i>	. . .	None (Greater Bombay being ignored)
<i>Central India</i>	. . .	North Hyderabad, South-West Madhya Pradesh, North-West Madhya Pradesh and Bhopal [South Hyderabad is also close to the margin.]
<i>North-West India</i>	. . .	None.

Cultivators are unusually small in number, and cultivating labourers unusually numerous in the following divisions : Travancore-Cochin (53 : 47), West Madras (60 : 40), and South-West Madhya Pradesh (53 : 47).

In the country as a whole, there are 84 owner-cultivators (with dependants) for every 16 tenant-cultivator (with dependants). Adopting the

ZONAL VARIATIONS

same standards as in the last case, those divisions of the country where the proportion is high and those where the proportion is low are identified below :

HIGH PROPORTION— Owner-cultivators number 90 or more and tenant-cultivators 10 or less in the following divisions :

<i>North India</i>	. . .	All the divisions except Uttar Pradesh Hills and Plateau
<i>East India</i>	. . .	Chhota Nagpur, Orissa Inland and Assam Hills
<i>South India</i>	. . .	Mysore and Madras Deccan
<i>West India</i>	. . .	Bombay Deccan Northern
<i>Central India</i>	. . .	East Madhya Pradesh, North Hyderabad, Madhya Bharat Hills and Vindhya Pradesh
<i>North-West India</i>	. . .	The two Himalayan divisions, Rajasthan Hills, Rajasthan Plateau and Ajmer.

LOW PROPORTION— Owner-cultivators number 75 or less and tenant-cultivators 25 or more in the following divisions :

<i>North India</i>	. . .	None
<i>East India</i>	. . .	Both divisions of West Bengal
<i>South India</i>	. . .	West Madras
<i>West India</i>	. . .	Bombay-Konkan, Greater Bombay and Kutch
<i>Central India</i>	. . .	Madhya Bharat Plateau
<i>North-West India</i>	. . .	East Rajasthan Plains and Rajasthan Dry Area. [Punjab Plain being an abnormal and temporary addition to this group]

36. In order to avoid misunderstanding it should be mentioned here that 'cultivating labourers' of Livelihood Class III are not necessarily all 'landless agriculturists'. Some of them do have land but so little that the wages they obtain from working for others is more important to them than the income from their own land. The same applies to Livelihood Class II also—some of them have plots of land of their own, but they are classified as tenant-cultivators if the income from rented land exceeds the income from owned land.

Contrariwise, the term 'agricultural landholders' would include every one in Livelihood Classes I and IV, but would not be limited to them. It would

CHAPTER III: LIVELIHOOD PATTERN—1951

include every one, not only in Livelihood Classes II and III, but also among the non-agricultural classes who had some permanent and heritable right in agricultural land— even though the income thus derived was less important than some other type of income.

With the help of information collected at the census about secondary means of livelihood it has been possible to compute separate figures for agricultural landholders and landless agriculturists. These are shown in a statement annexed to the detailed review of census economic data (APPENDIX III).

According to this statement, *there are 402 landless agriculturists for every 1,000 agricultural landholders. There are enormous differences in this respect from state to state. This number (of landless agriculturists per 1,000 agricultural landholders) is smallest in Uttar Pradesh (161) and largest in Travancore-Cochin (782).*

The numbers for other major states, arranged in order, are as follows : Mysore (190), Assam (235), Orissa (271), Bombay (383), Madhya Bharat (397), Madhya Pradesh (413), Hyderabad (507), Bihar (510), Rajasthan (544), West Bengal (609) and Madras (714)

C — *Comparison with U.S.A., and Great Britain*

It is NOT easy to establish detailed comparison with other countries of the world in respect of the data reviewed in this chapter. This is so for a number of reasons. To begin with, there are little or no published data for a great many countries. Secondly, not all the available figures are in a comparable form. Thirdly, the economy of every large country is a complex affair and the problems involved in expressing it in quantitative terms which can be used for comparison of different countries with one another cannot be said to have been solved satisfactorily.

However, a few comparisons have been attempted in two aspects— where published figures seemed to permit such comparisons— with the United States of America and Great Britain. The results are set out in the diagram facing this page.

38. The first aspect of the comparison refers to what may be called the 'burden of dependency'. If we consider 1,000 self-supporting persons in

COMPARISON WITH U S A , AND GREAT BRITAIN

India— who are also gainfully employed—, they support by their exertion, themselves as well as 2,504 other persons. These include 373 persons who are earning dependants—in other words, only partially dependent on the 1,000 we are considering—; and 26 rentiers and pensioners who, though not a burden on their own household, are nevertheless supported ultimately by the exertion of the 1,000 persons we are considering .

In the United States of America the number corresponding to our 2,504 is only 1,547. In Great Britain it is even less—it is only 1,207. We do not know whether these numbers include any persons corresponding to our 373 earning dependants, and if so, in what number. We may, if we choose, ignore them altogether (as in the diagram). The difference in the burden of dependency is still very large

To a large extent, the difference arises out of the fact that we have a much larger proportion of infants, young children and grown up children under 15 than in United States or Great Britain. On the scale we are following (*viz*, 1,000 self-supporting and gainfully occupied persons) the number aged 14 or less is 1,317 in India, 702 in United States and 496 in Great Britain. While this is an important part of the explanation, it is only a part. The diagram shows that even after this number is separated, the remaining burden of dependency is still heavier in India than in United States or Great Britain. The conclusion follows— even people of working age are less fully employed in India than in these countries.

39. The second aspect of the comparison is the distribution of these 1,000 self-supporting persons who are gainfully employed among the different sectors of productive activity. The comparison is shown below :

TABLE 19

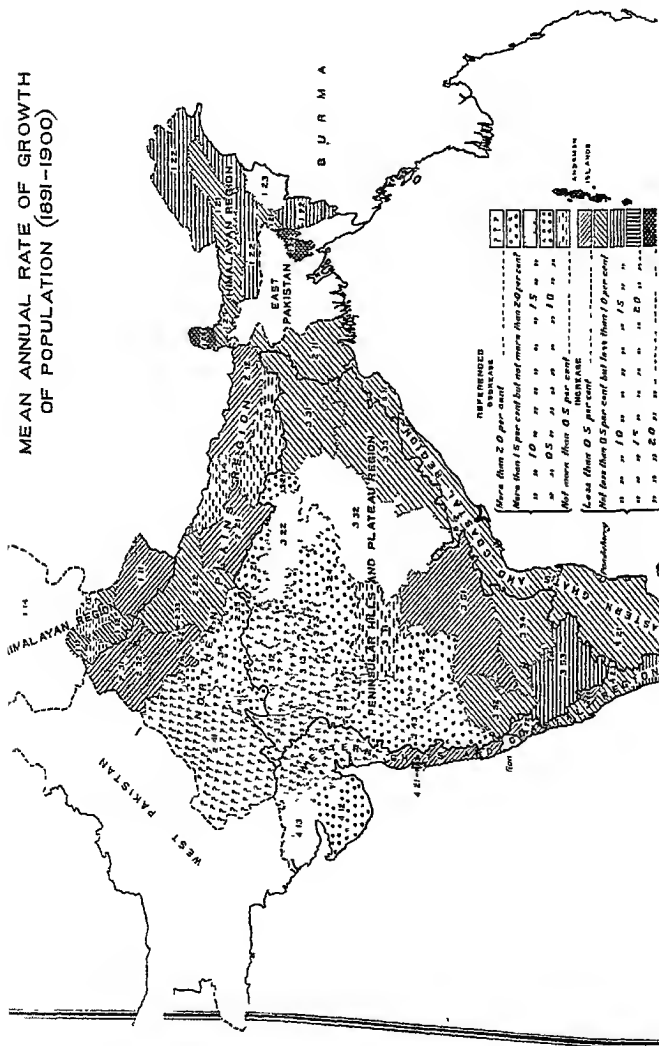
—	<i>India</i>	<i>U S A</i>	<i>Great Britain</i>
<i>A</i> —Agriculture, animal husbandry, forestry and fishing .	706	128	50
<i>B</i> —Mining, manufacture and commerce	153	456	555
<i>C</i> —Other industries and services	141	416	395
	<u>1,000</u>	<u>1,000</u>	<u>1,000</u>

The numbers in Category *A* represent broadly the man-power devoted to food production. The differences verge on the fantastic. In India 706 persons out of 1,000 are engaged in producing their own food and a small surplus which just falls short of being sufficient for the other 294. In United States 128 persons produce a surplus in excess of their own food requirements which not only suffices for the needs of the other 872 but yields a margin for export to other countries. In Great Britain a large majority of the people are fed by foreign producers of food. Even so, the allocation of only 50 to food production is astonishing.

The differences in the numbers in Category *B* reflect broadly the differences in the extent of industrialisation of these countries. Together with the figures of Category *C*, they show the great differences that exist regarding the amount of goods and services other than food which the people of different countries have at their disposal. They mark the distinction between affluence and poverty.

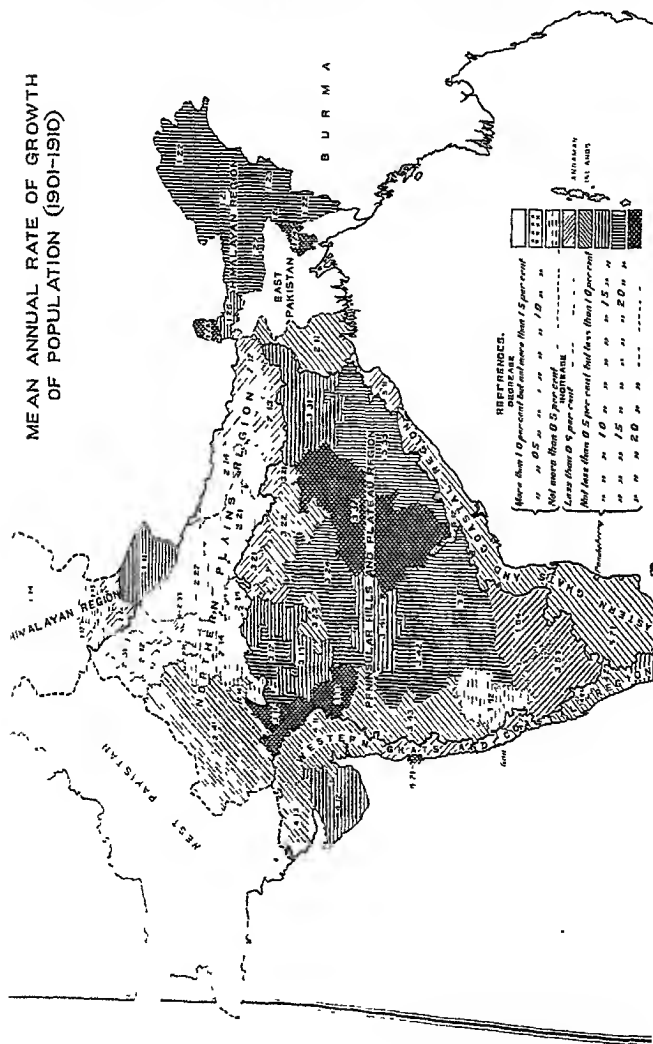
Growth of Population — 1891-1900

MEAN ANNUAL RATE OF GROWTH OF POPULATION (1891-1900)



Growth of Population — 1901-1910

MEAN ANNUAL RATE OF GROWTH OF POPULATION (1901-1910)



Growth of Population — 1911-1920

MEAN ANNUAL RATE OF GROWTH OF POPULATION (1911-1920)

HIMALAYAN REGION

NORTHERN REGION

WEST PAKISTAN

EAST PAKISTAN

MADHYA PRADESH AND PUNJAB REGION

WESTERN REGION

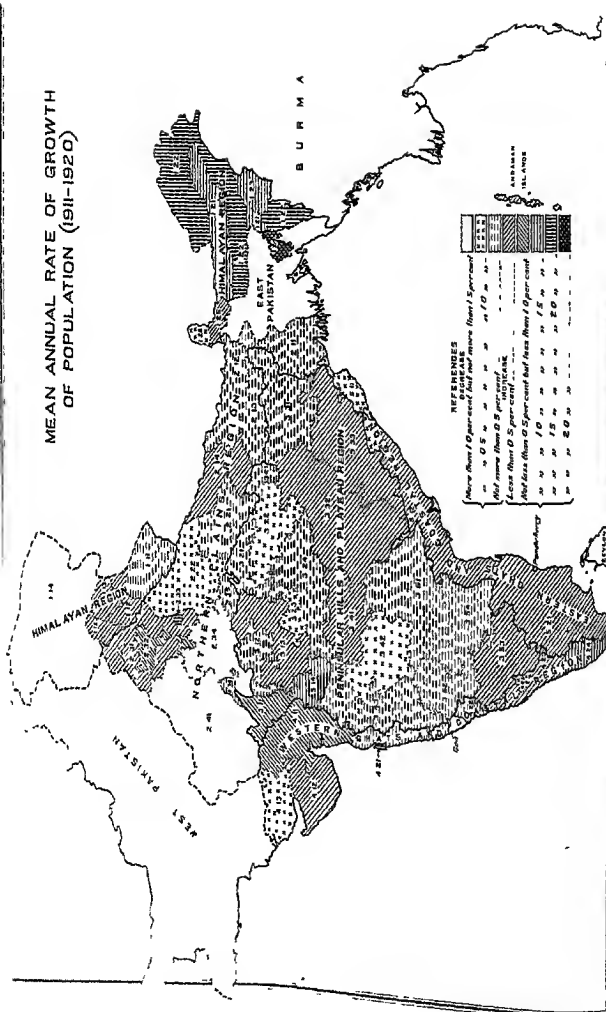
BURMA

ARABIAN SEA

INDIAN OCEAN

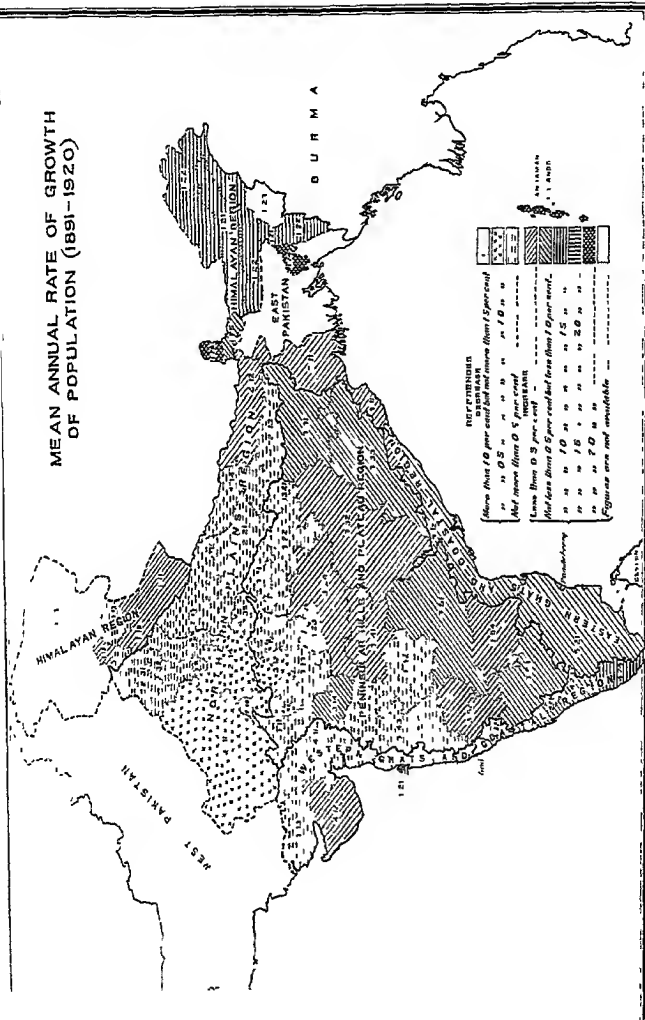
REFERENCE

Male		Female	
More than 10 per cent	5 per cent	More than 10 per cent	5 per cent
10	5	10	5
15	10	15	10
20	15	20	15
25	20	25	20
30	25	30	25
35	30	35	30
40	35	40	35
45	40	45	40
50	45	50	45
55	50	55	50
60	55	60	55
65	60	65	60
70	65	70	65
75	70	75	70
80	75	80	75
85	80	85	80
90	85	90	85
95	90	95	90
100	95	100	95



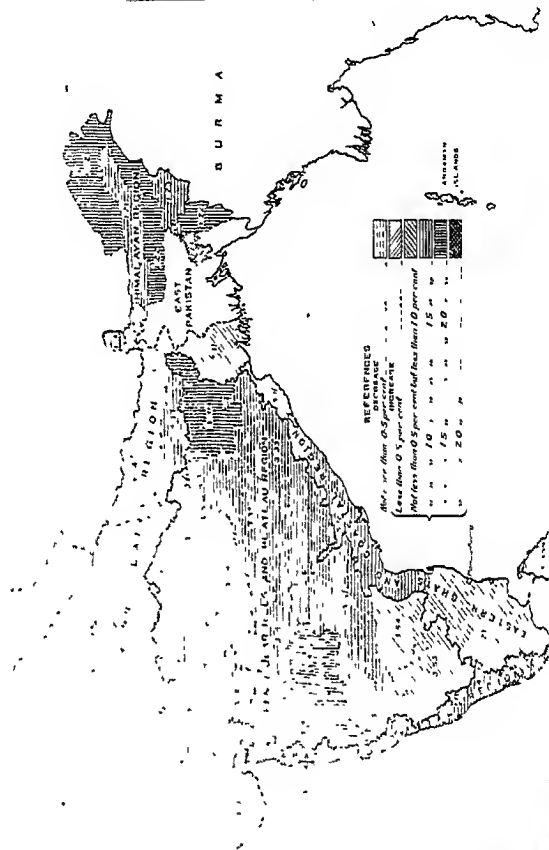
Growth of Population — 1891-1920

MEAN ANNUAL RATE OF GROWTH OF POPULATION (1891-1920)



Growth of Population — 1921-1930

MEAN ANNUAL RATE OF GROWTH OF POPULATION (1921-1930)

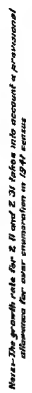


REFERENCES

Not more than 0.5 per cent increase	0.5 to 1.0 per cent increase	1.0 to 1.5 per cent increase	1.5 to 2.0 per cent increase	2.0 to 2.5 per cent increase	2.5 to 3.0 per cent increase	3.0 to 3.5 per cent increase	3.5 to 4.0 per cent increase	4.0 to 4.5 per cent increase	4.5 to 5.0 per cent increase	5.0 to 5.5 per cent increase	5.5 to 6.0 per cent increase	6.0 to 6.5 per cent increase	6.5 to 7.0 per cent increase	7.0 to 7.5 per cent increase	7.5 to 8.0 per cent increase	8.0 to 8.5 per cent increase	8.5 to 9.0 per cent increase	9.0 to 9.5 per cent increase	9.5 to 10.0 per cent increase
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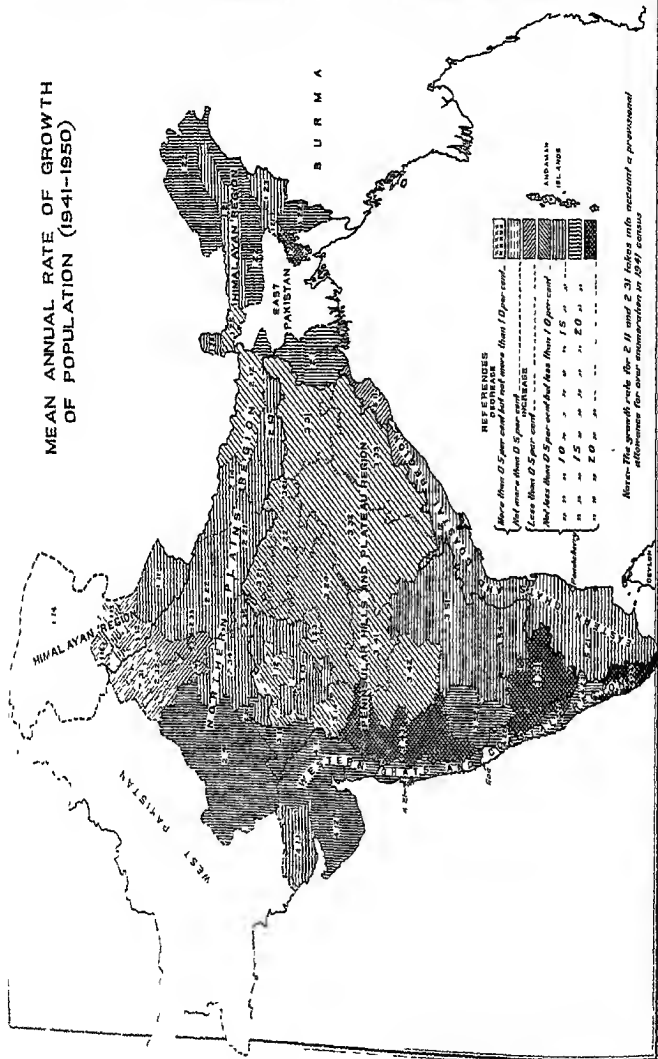
Growth of Population — 1931-1940

HIMA



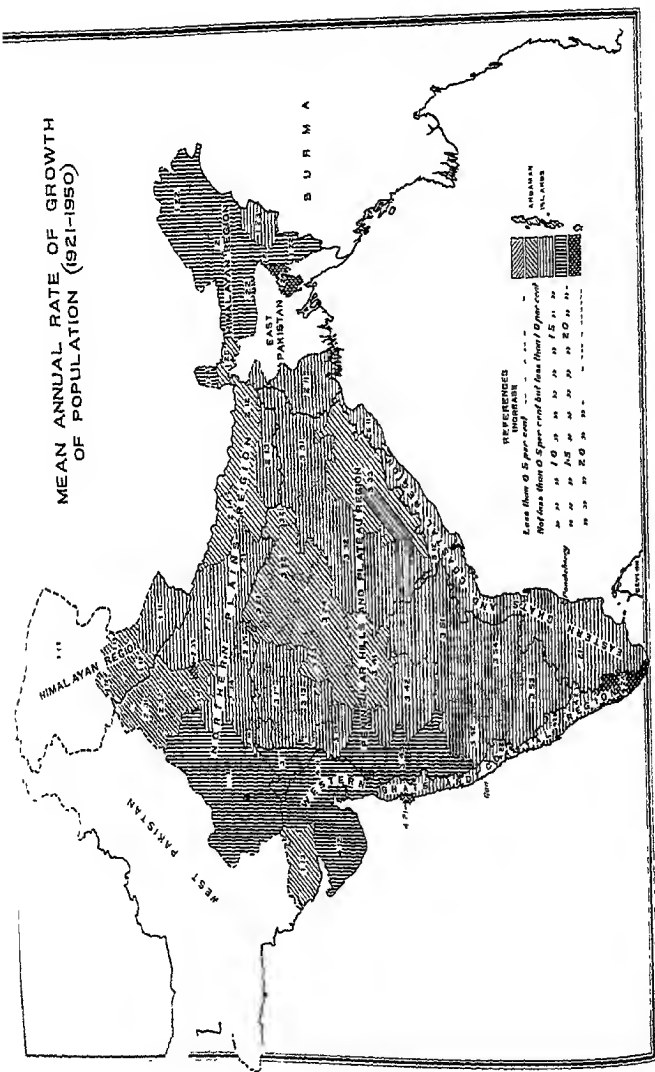
Growth of Population — 1941-1950

MEAN ANNUAL RATE OF GROWTH OF POPULATION (1941-1950)



Growth of Population — 1921-1950

MEAN ANNUAL RATE OF GROWTH OF POPULATION (1921-1950)



Growth Rates for six decades — 1891-1901 to 1941-1951

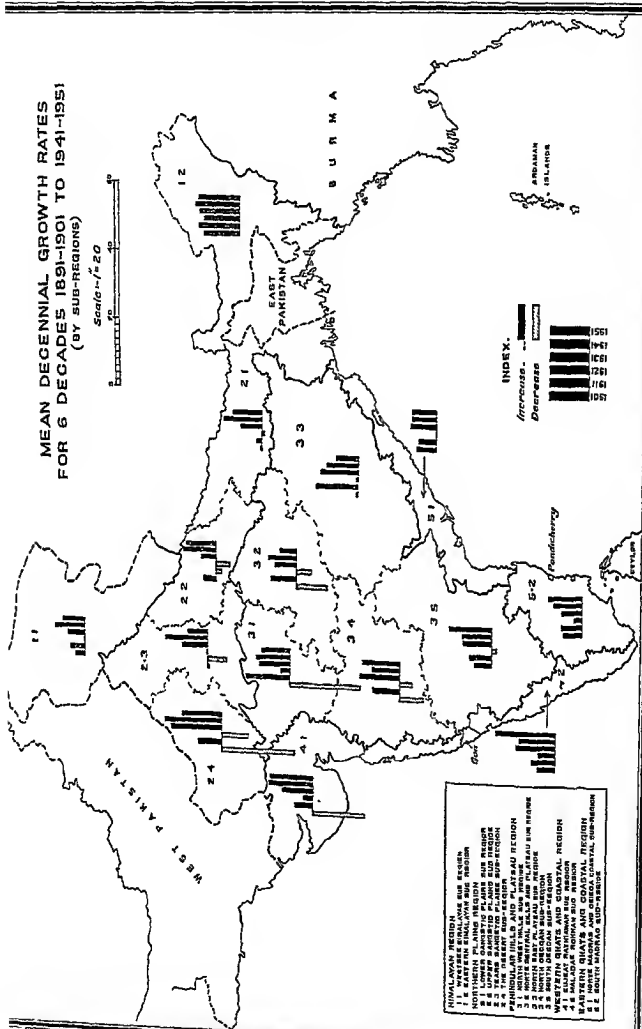
MEAN DECADENNIAL GROWTH RATES FOR 6 DECADES 1891-1901 TO 1941-1951 (BY SUB-REGIONS)

Scale 1" = 20



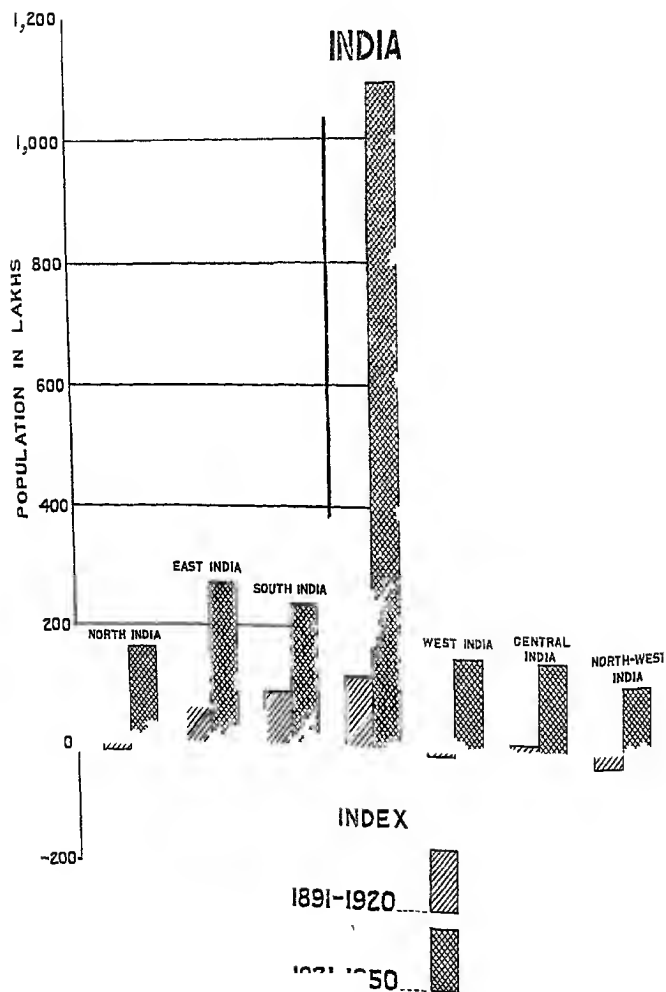
- HIMALAYAN REGION**
1. WESTERN HIMALAYAN SUB-REGION
2. EASTERN HIMALAYAN SUB-REGION
- NORTHERN PLAINS REGION**
3. NORTH WESTERN PLAINS SUB-REGION
4. NORTH CENTRAL PLAINS SUB-REGION
5. NORTH EAST PLAINS SUB-REGION
- PENINSULAR HILLS AND PLATEAU REGION**
6. NORTH WESTERN HILLS SUB-REGION
7. NORTH CENTRAL HILLS SUB-REGION
8. NORTH EAST HILLS SUB-REGION
9. NORTH WESTERN PLATEAU SUB-REGION
10. NORTH CENTRAL PLATEAU SUB-REGION
11. NORTH EAST PLATEAU SUB-REGION
- WESTERN GHATS AND COASTAL REGION**
12. WESTERN GHATS SUB-REGION
13. WESTERN COASTAL SUB-REGION
- EASTERN GHATS AND COASTAL REGION**
14. EASTERN GHATS SUB-REGION
15. EASTERN COASTAL SUB-REGION
- SOUTH INDIA SUB-REGION**
16. SOUTH INDIA SUB-REGION

INDEX.



Additions to Population during 30 years
before and since 1921

ADDITIONS TO POPULATION DURING 30 YEARS BEFORE AND SINCE 1921



CHAPTER IV

Before and Since 1921

A — *Growth of population : checked and unchecked*

THE PICTURE given in the last three chapters of the number and distribution of people on the land and the pattern of life and livelihood relates to 1951. But the picture does not remain the same, even for a day, it changes imperceptibly but nonetheless surely, and the rate of change has been quickening in recent decades. It is necessary that we should have a clear appreciation of how the picture changed in the past; and also in so far as it is possible to know this, why it changed as it did and not otherwise: If we succeed in gaining a correct and complete appreciation of the way in which the wheels of life have been turning in the past, we shall be able to peer into the future and form a correct opinion about the changes which are likely to come about in the future. The future, of course, is not totally determined by the past. Neither is it (as some are apt to suppose) simply clay in our hands to be moulded as we may fancy. It lies within our power so to influence the course of events as to avert danger and promote welfare and happiness; but there are very definite limits to this power. Those who have the responsibility of governance have to distinguish between right and wrong action with reference mainly to these limits. The purpose of this chapter is to bring the past under review in such a way that the course of right action for the future may become at least a little clearer than it is.

2. As the census is taken at ten-yearly intervals, our unit of time for the measurement of changes must be the decade. The minimum requirements for a review of changes must, therefore, be at least two decades before 1951, in order that the trend of change disclosed by two successive decades might give us an insight into the decade immediately following the 1951 Census.

This is, however, not long enough. Though we live in a fast-moving world, we need to look back longer in order to gain a clear perspective.

It is proposed in this chapter to review the changes which took place over six decades—three before and three after the 1921 Census. On the basis of this review, it is suggested that an attempt should be made to visualise the prospect for 1981.

CHAPTER IV . BEFORE AND SINCE 1921

As it happens, the choice of 1921 as the central year of the review period is not merely convenient—it is a necessity. There is a profound difference between the trend of growth after that year and the trend of growth in preceding decades. Dry figures of the census which record the growth of the people acquire meaning and significance only when the sharp contrast between the decades before and since 1921 is clearly understood and constantly borne in mind.

3 The Indian Census of 1891 was taken over a territory which comprised India of today as well as Pakistan and Burma. The internal territorial divisions

TABLE I

Census year	Number (IN LAKHS)	Increase(+) / decrease(-) during preceding decade (IN LAKHS)
1891 . .	2,359	
1901 . .	2,355	— 4
1911 . .	2,490	+135
1921 . .	2,481	— 9
1931 . .	2,755	+274
1941 . .	3,128*	+373
1951 . .	3,569	+441

were very different. But the figures of old censuses have been readjusted to the present limits and territorial divisions and the readjusted figures have been published. TABLE I shows the growth in numbers of the people inhabiting the territory where the 1951 Census was taken.

4. During the thirty years between 1891 and 1920 the number of the people increased by 122 lakhs—which is just a little more than the number of people living in the Punjab Plain division or the South Bihar Plain division and just a little less than the number of people living in the Northern division of Bombay Deccan.

During the ten years between 1921 and 1930 the number increased by 274 lakhs—that is to say, by much more than twice the increase which had occurred during the preceding 30 years. The addition to the population which took place during one decade was distinctly larger than the present population of West Bengal and not far short of the total number of people living in two major states, Rajasthan and the Punjab combined.

During the ten years between 1931 and 1940 the number increased by 373 lakhs—that is to say, by more than three times the increase which had occurred

*According to the 1941 census count, this figure should be 3,748. It is necessary, however, to deduct 20 lakhs, as the estimated allowance for inflation of returns in West Bengal and Punjab. For a fuller account of this deduction and the reasons for the view that the recorded figures of successive censuses are sufficiently accurate and comparable, reference may be made to paras 10-15 of APPENDIX II.

during the thirty years 1891-1920. This time, the size of the additional population exceeded the present population of Bombay state. It also exceeded the combined present population of all the North-West India states.

During the ten years between 1941 and 1950 the increase has been much larger than during the previous decades. The addition to the population—44·1 lakhs—is larger than the combined present population of the West India states. It is larger than the present population of Bihar and not far short of the combined present population of West Bengal, Orissa and Assam.

During the thirty years following 1921, our numbers have increased from roughly 25 crores to 36 crores. The addition—of about 11 crores—is almost exactly the number of people at present living in North India and Central India combined ; or in South India and West India combined.

5. When we pause and think of these figures and their implications, the first reaction is one of wonder whether they could really be true, or whether something has gone wrong with the figures somewhere. It seems so difficult to believe that 1921-50 could have been so very different, after all, from 1891-1920. Though the number of people who are old enough to remember all about 1891 from personal experience must be quite small now, yet almost every person who is over forty can recall enough facts from personal experience which might induce him to distrust these figures.

Reasoning based on common sense and personal experience would run on some such lines as follows : "We know roughly how many children are born these days to womenfolk in our own families and friends' We also know the numbers born to the womenfolk of an older generation — our mothers and grand mothers. It is true enough that our womenfolk do not practise contraception as they do in western countries and so may have more children. We need not quarrel with the figures given in an earlier chapter; they are probably correct. But then, this is nothing new. Our mothers and grandmothers did not practise contraception either. They bore as far as we can judge, just as many children— if not, indeed, more. So, it cannot be true that our numbers began to increase all of a sudden because of any sudden change in the child-bearing habits of our womenfolk. Well then, if we rule out a large increase of births, then we should assume a sensational decrease in the deaths to account for the contrast between the two thirty-year periods. But has there been any such decrease? We have very grave doubts. There has, perhaps, been some decrease. It is true that hospitals and dispensaries have been springing up and doctors have increased in numbers. There are also the public health staffs. Something is being done about vaccination

CHAPTER IV : BEFORE AND SINCE 1921

and inoculation and the rest of it. New medicines are advertised and sold in shops. Granted all this, how much do they all amount to? And what difference has it made to the villages of which we have personal knowledge? Is it true that many more people are living longer? Where is the evidence? We can recall so many people of an older generation who lived long. In some ways, perhaps, they were a much harder type than the present generation. *No, there must be something wrong about these figures."*

The reasoning based on common sense and general experience is plausible, to some extent it is also correct. Yet the conclusion is wrong. There is no reasonable doubt that *the startling differences in the numbers added to the population during the two thirty-year periods are real.* The explanation would be simple if we draw a distinction between what may be called 'normal deaths' and 'abnormal deaths'. It is correct that child-bearing habits have not materially changed. It is also correct that the incidence of normal deaths has slightly diminished, but not sensationally. The diminution in the incidence of normal deaths is wholly insufficient to account for the contrast between the two periods. *The main explanation is that 'abnormal deaths' used to claim a great many victims in the earlier period. They did not occur or were prevented from occurring during the later period.*

6 Before we set out the evidence bearing on this explanation, let us follow the figures further and examine whether the contrast we are discussing is observable in all parts of India or is localised.

TABLE 2

Zone	(IN LAKHS)				
	Number			Increase (+) Decrease (-)	
	1891	1921	1951	1891-1920	1921-50
North India	479	467	632	- 12	+165
East India	563	628	901	+ 65	+273
South India	426	517	756	+ 91	+239
West India	263	254	407	- 9	+153
Central India	359	373	523	+ 14	+150
North-West India	269	242	350	- 27	+108
INDIA	2,359	2,481	3,569	+122	+1,088

GROWTH OF POPULATION * CHECKED AND UNCHECKED

The contrast, it is clear, is present in all the six zones. In three zones, there was no increase at all, but a reduction of population in the earlier period. In one zone, there was a very small increase—which was less than one-tenth of the increase in the later period. There was a sizeable increase of population during 1891-1920 only in two zones—South India and East India, even here the combined increase was less than one-third of the increase which occurred during 1921-50.

7. Figures of a similar nature are furnished below for the different sub-regions of India :

TABLE 3

Sub-region	(IN LAKHS)				
	Number			Increase (+) Decrease (-)	
	1891	1921	1951	1891-1920	1921-50
1.1 Western Himalayan	32	35	46	+ 3	+ 11
1.2 Eastern Himalayan	49	77	124	+28	+ 47
2.1 Lower Gangetic Plains	488	498	701	+10	+ 203
2.2 Upper Gangetic Plains	295	286	389	- 9	+ 103
2.3 Trans-Gangetic Plains	201	183	259	-18	+ 76
2.4 The Desert	35	26	46	- 9	+ 20
3.1 North-West Hills	74	72	104	- 2	+ 32
3.2 North Central Hills and Plateau	115	107	138	- 8	+ 31
3.3 North-East Plateau	171	204	290	+33	+ 86
3.4 North Deccan	165	159	239	- 6	+ 80
3.5 South Deccan	186	213	315	+27	+ 102
4.1 Gujrat-Kathiawar	111	101	161	-10	+ 60
4.2 Malabar-Konkan	114	142	238	+28	+ 96
5.1 North Madras & Orissa Coastal	136	157	211	+21	+ 54
5.2 South Madras	187	223	307	+36	+ 84

Seven of these fifteen sub-regions recorded no increase during 1891-1920 but suffered a reduction. To this group we should add the Lower Gangetic Plains where the increase was so small in relation to the population that the number

may be regarded as having been practically stationary. There are thus eight sub-regions where we counted in 1951 nearly 20 crores of people out of 36 crores. In 1921, there were only 14 crores of people while in 1891 there had been 14½ crores of people. The contrast between a decline of half-a-crore in the first thirty years and an increase of 6 crores in the next thirty years is unmistakable.

Turning to the other seven sub-regions where population had grown during the first thirty years, the acceleration of this growth during the second thirty-years is unmistakable in every case without any exception.

8. The population of India decreased by 0.2 per cent in 1891-1900, increased by 5.6 per cent* in 1901-10 and again decreased by 0.4 per cent in 1911-20. On the other hand during the three decades after the 1921

TABLE 4

Zone	Mean Decennial Growth Rate	
	1891-1920	1921-50
North India .	-0.8	+10.0
East India .	+3.7	+11.9
South India .	+6.5	+12.5
West India .	-1.4	+15.4
Central India .	+1.2	+11.2
North-West India	-3.6	+12.2
INDIA .	+1.7	+12.0

Census, population increased by 10.4 per cent in 1921-30, 12.7 per cent in 1931-40 and 13.2 per cent in 1941-50. If the average rates for the two thirty-year periods are considered, population grew between 1891 and 1920 at the rate of 1.7 per cent per decade, while between 1921 and 1950 it grew at the rate of 12.0 per cent per decade. Every zone exhibits this contrast as shown in TABLE 4.

9. If we analyse the figures of increase and decrease during 1891-1900 division by division and group the divisions according to the rates of increase or decrease recorded, the results are as follows.

Increases were recorded in divisions representing two-thirds of the country (on a population basis). The increase ranged between 5 per cent and 10 per cent over two-fifths of the country. Higher rates of increase were recorded in very small areas, while lower rates of increase were far more common.

The decreases occurred in the parts of the country inhabited by a third of the people. The rates of decrease were very heavy, exceeding 25 per cent in Rajasthan Dry Area, Rajasthan Hills, Rajasthan Plateau, Madhya Bharat

*The rate of increase and decrease are expressed as percentages of the *mean* population of the period during which the increase or decrease occurred.

GROWTH OF POPULATION : CHECKED AND UNCHECKED

Plateau, Madhya Bharat Hills, Bhopal and Bombay-Gujrat Decreases ranging between 15 and 20 per cent occurred in Saurashtra and North Hyderabad; between 10 and 15 per cent in Ajmer, Kutch, Vindhya Pradesh, North-West Madhya Pradesh and East Madhya Pradesh; between 5 and 10 per cent in East Rajasthan Plain, Uttar Pradesh Hills & Plateau and the Northern division of Bombay Deccan; and less than 5 per cent in South-West Madhya Pradesh, East Uttar Pradesh Plain, South Bihar and Himalayan Punjab

10. The principal reason for these decreases during the decade 1891-1900 must be found in the very severe famines which are known to have raged in the greater parts of these divisions during the decade. The following reference to these calamities is extracted from the 1901 All-India Census Report.

"In 1891-92 there was scarcity over a considerable area in Madras and Bombay and in parts of Bihar. In 1895 a weak monsoon led to extensive crop-failure in the southern districts of the United Provinces, and a sudden cessation of the rains of 1896 resulted in famine in the United Provinces, the Central Provinces and Berar and parts of Madras, Bombay, Bengal, the Punjab, Upper Burma, Rajputana, Central India and Hyderabad. Altogether an area of about 300,000 square miles with a population of nearly 70 millions was affected and on the average, two million persons were relieved daily during the twelve months from October 1896 to September 1897; the number rose to more than 4 million at the time of greatest distress.

"In 1899 the monsoon again failed, and the results were even more disastrous, for though the population affected was slightly less than in 1896-97, famine conditions prevailed over an area half as great again and with less easy means of communications, the drought was much more severe, the people had not yet recovered from the previous visitation, the mortality amongst cattle from want of fodder and water was far heavier, and the tracts which suffered most lay for the greater part in Native States, where the relief organisation was necessarily less perfect than in British territory. In the height of this famine there were for weeks together over six million persons in receipt of relief, and the value of the agricultural production of the year was estimated to have been 60 millions sterling below the average, there was also a loss of some millions of cattle. It is impossible to say with any pretence to accuracy what was the actual mortality caused by these calamities. The Commission of 1901 thought that about a million deaths were attributable to the famine of 1899-1900 in British territory, and it would probably be safe to assume that another three millions must have occurred in the Native States, which contained more than three-fifths of the population afflicted and where the relief operations were generally far less successful. No estimate has been made of the excess mortality in 1896-97 but it cannot have been much less than a million. The total mortality due to the two famines may therefore be taken roughly at five millions. The diminished vitality of the people resulted also in a heavy fall in the birth rate, but this was to some extent counter-balanced by an unusually high rate of reproduction when the people had recovered their normal conditions."

Vivid accounts of the impact of these famine conditions in many parts of India (notably Bombay, Berar and the Central Provinces) are found in

other extracts from census reports which are printed among the papers in APPENDIX IV.

11 Another cause of heavy mortality during the decade was plague. "Excluding a small tract in the Himalayas where it has long been endemic, bubonic plague made its first appearance in India in modern times in Bombay City in September 1896 and after spreading over the Western Presidency, notwithstanding the measures taken to prevent its dissemination, gradually extended its ravages to other parts of India. By the date of the census the recorded mortality was nearly half a million, to which Bombay contributed seven-tenths and Bengal two-thirds of the remainder; Mysore with 33,731 reported deaths had suffered heavily in proportion to its population and so too had Baroda and Hyderabad. The extent to which the actual number of deaths exceeded that reported is uncertain, but it is known that the difference was very considerable and it may be assumed that the true mortality from plague was not less than three-quarters of a million and may possibly have been a million."

This brief account is supported by several references in local census reports describing the ravages of plague in different parts of the country and assessing their effect in arresting the growth of numbers.

Some parts of the country, *e.g.*, Bihar, were visited by both famine and plague at the same time. The figures disclosed— even after full allowance for errors and uncertainties— an unmistakable stagnation of the rate of growth. The reports contain a detailed discussion and some difference of opinion as to which was the more effective check. One report cites a series of comparative figures tending to show that plague was the real killer and not famine; it seemed that the decline of population was closely correlated to the known severity of the incidence of the plague, while there was not only no decline, but some modest increase in areas where famine was known to have been severe. According to a different view it is "extremely probable that the reduction in the rate of increase of the population is very largely due to a decline in the birth rate induced by the general rise in the price of staple foodgrains. . . In South Bihar, common rice is dearer by 26 per cent, maize by 32 per cent and wheat by 29 per cent, while during the same period the wages of agricultural labourers have fallen by 3 per cent. Conditions such as these can hardly fail to affect the reproductive energy of the large class of unskilled labourers who own no land and have not participated in the profits arising from the enhanced prices of agricultural produce. Nor are they confined to South Bihar. They extend in varying degrees to all parts of Bengal and although their influence on the birth rate may not always be traceable, we may be sure that it is there".

GROWTH OF POPULATION : CHECKED AND UNCHECKED

12. While famine and plague raged over very extensive areas there are also references to the localised deadliness of epidemics of malaria, *kala-azar* and other fevers. Thus, in the United Provinces, excessive and badly distributed rainfall in the early years of the decade "led to a severe outbreak of malarial fever which in 1894, raised the death rate to an exceptional height and sapped the vitality of the people to such an extent that the birth rate in 1895 was unusually low". In Western Bengal, the natural growth was normal in areas which were "recovering from a cycle of malaria" but it was only 1.4 per cent in Hooghly "where fever is rife and the population would have been stationary but for the influence of the mills and factories of Serampur". In Assam, "*kala-azar* entered Kamrup and reduced the population of the southern part of the district by nearly 12 per cent. Having spent its force there, it passed on in 1892 to Nowgong where its tract is marked by deserted villages, un-tilled fields, a land revenue reduced by 23 per cent, and a disheartened population, which after 19 years of steady increase has now receded to the figure at which it stood nearly 50 years ago".

13. During the next decade (1901-10) the seasonal conditions were much more favourable. The local census reports refer frequently to 'agricultural conditions' being 'normal' or 'prosperous'. Droughts appear to have visited their usual haunts in the brown and yellow belts— followed by scarcity, sometimes even by famine. There is also an isolated reference to crop failure in the Coastal division of Orissa. But the days when people died in large numbers because of local crop failures, seemed to have been ended. To foresee the approach of scarcities and famines, to take measures to prevent or mitigate their actual incidence, and to organise and administer relief so as to save life with certainty and yet do it economically—all these tasks had been accepted, learnt and reduced to routine administrative operations. The reports of this decade contain no suggestion of mortality or other ill-effects arising out of famine. But there were other checks on the growth of population. The reports show clearly that plague was continuing to take even heavier toll than in the previous decade. "The mortality from it rose from about a quarter of a million in 1901 to 1.3 millions in 1907. It fell below a quarter of a million in each of the next two years, but in 1910 it exceeded half-a-million. The total number of deaths from plague during the decade was nearly "6.5 millions, of which over one third occurred in the Punjab and two fifths in the United Provinces and Bombay taken together. The disease fortunately has failed to establish itself in Bengal, Assam and on the East Coast and in the extreme south of the peninsula. Thus, moreover, is only the recorded mortality. As is well known, when epidemics are raging the reporting agency breaks down and a large

number of deaths escape registration. The omissions are most numerous in the Native States, where registration is usually far less accurate than in British territory". Plague was not the only killer during the decade. "Epidemics of malarial fever decimated the irrigated tracts of the Eastern and Central Punjab and the Ganges-Jumna Doab in the United Provinces, where, in 1908 alone, the reported mortality from fevers was nearly two millions". The reference in these cases is not to the areas where the disease is endemic; but to outbreaks of the disease in epidemic form. A report from the United Provinces explains that the "malaria epidemic appears to have made most headway in those districts where the disease is not as a rule specially prevalent and least in those in which it is in a high degree endemic".

14. The differences in conditions, thus described, between the two decades is reflected in the pattern of growth. Whereas in the earlier decade increases were recorded in two-thirds of the country, they occurred during this decade in about three-fourths of the country. Areas in which the increase exceeded 10 per cent contained only 4.3 per cent of the population in the earlier decade, they contained 26.4 per cent of the population in the later decade. The area in which decreases occurred, was limited to three divisions of Uttar Pradesh, the Punjab, the Patiala and East Punjab States Union and the Southern division of Bombay Deccan. In the country as a whole, population grew from 2,355 lakhs to 2,490 lakhs.

15. The next decade (1911-20) was extraordinary in many ways. The opening year was unhealthy—a sharp increase in attacks and deaths from plague, cholera and malaria occurred in widely different parts of the country. Then for five years, there were good seasons and good crops and public health was much better. The first world war began and ended. The last three years of the decade turned out to be deadly. Economic disorganisation—the aftermath of war—coincided with two successive bad seasons and extensive crop failures. Plague and cholera resumed their sway. Assam reported a recrudescence of 'kala-azar'. In Bengal "malaria was specially severe throughout the period, which was characterised by a low birth rate and a mortality which in several districts steadily exceeded the births". But all these misfortunes paled into insignificance, when a world-wide epidemic of influenza swept the country from one end to the other in two waves, one closely following the other. A full account of this terrible visitation will be found among the papers printed in APPENDIX IV. The account includes a "conservative estimate" of the mortality at "between 12 and 13 millions for India, a large part of which occurred in the space of three or four months".

GROWTH OF POPULATION : CHECKED AND UNCHECKED

In general, the coastal areas escaped with a low mortality. So also East India. Uttar Pradesh, Punjab, Bombay and Madhya Pradesh suffered heavily. The rural areas were most severely infected, "the reason probably being that while villages have no advantage over towns in the matter of overcrowding, sanitation and ventilation, the urban areas have the benefit of qualified medical aid and organised effort".

The pattern of growth during the decade 1911-1920 reflected the conditions thus described. There was an overall decrease from 2,490 lakhs in 1911 to 2,481 lakhs in 1921. In the two earlier decades the divisions in which decreases had occurred were one-third and one-fourth of India (on a population basis). In this decade, decreases occurred in divisions which contained more than one-half of the total population of India. Even where increases occurred they were small; the divisions where increases exceeded 5 per cent represented only about one-tenth of India. The natural checks which restrain the growth of population were seen at their worst during this decade.

16 We now reach the turning point. We hear no longer about abnormal deaths—until we come to the Bengal Famine of 1943

Already, as mentioned before, famine had lost its terror. In 1921, the Census Commissioner wrote: "Famine relief organisation is now so highly perfected in India that scarcity is not necessarily accompanied by high mortality". His successor in 1931 could say: "There has, however, been no serious famine in the decade under review... Improvements in communications, nowadays prevent anything like the famine mortality of a century ago... Famines were local and not very serious, though one unfortunate district of Madras had famine declared in it officially for three seasons."

It was not merely the fruits of victory over famine that the country was enjoying. A new note of confidence in the fight against epidemic diseases was beginning to be heard. According to the 1931 Census Report, "Every year sees improved methods of fighting such epidemics as cholera, plague, or *kala-azar*. Indeed, a completely effective treatment for the latter pest has been perfected since the last census, and has made it possible to stamp out the disease".

Detailed accounts of the course of the seasons and conditions of public health during the last and earlier decades are given in state census reports published separately. They need not be recounted here.

Though the usual cycles of vicissitudes of the seasons continued and the brown and yellow belts of the country continued to suffer from droughts which caused severe scarcities and sometimes famines, there was no extraordinary

calamity (except the Bengal Famine of 1943). By about 1921, the freedom movement acquired a genuinely national character; and the British Government were carrying out reforms which culminated in the transfer of power in 1947. There was a conscious effort to develop 'nation building' services and a spurt of activity occurred in the 'transferred' departments which dealt mainly with public health and education. For a few years before the outbreak of World War II, when Provincial Autonomy arrived and popular ministries took charge of Provincial Governments, further advances were registered. In the result, the organisation of public health establishments has been steadily strengthened and their methods of combating epidemic diseases—especially through control of fairs and festivals—have become increasingly efficient. Mention has been made already of the distinction between outbreaks of malarial fever in the form of epidemics and their perennial prevalence in many parts of the country where the disease is endemic. An attack on the latter problem gathered momentum during the last decade. It seems likely, that in these areas the death rate must have been consistently higher and the birth rate consistently lower than elsewhere. Though the data are not conclusive there are indications to the effect that the lethal effects of endemic malaria were getting progressively reduced during the last thirty years and this progress has been substantially accelerated during the last decade.

17 We may now go back to our question—Are the figures really true?—and our answer that they are. There is no doubt that during the thirty years before the 1921 Census severe checks of one kind or other were in operation which tended to increase deaths abnormally. Such checks also had the effect, in some cases, of diminishing the births abnormally. The natural checks on population growth fall into three groups as below :

- (i) Famines (including famine diseases)
- (ii) Epidemic diseases, and
- (iii) Endemic diseases.

These three groups of natural checks were responsible for keeping the 'mean decennial rate of growth' during the first thirty-year period as low as 1.7 per cent, and actually bringing about a reduction of population in three zones out of six. Even during 1891-1900, when the first of these checks, *viz.*, famines devising and perfecting the counter-checks by which the natural checks could be prevented from operating. These counter-checks comprised : *First*, the creation of conditions in which the development of agricultural production would be both possible and profitable and take place of its own accord; *Secondly*,

Droughts and Floods during 30 years before and since 1921

DROUGHTS AND FLOODS BEFORE AND SINCE 1921

(SOURCE: RAINFALL AND AGRICULTURE BY SHRI L. A. RAMDAS)

INDEX.

DROUGHTS ----- ●

FLOODS ----- ○

	Assam	Bengal	Orissa	Chota Nagpur	Bihar	U. P. East	U. P. West	Punjab E. and N.	Kashmir	Rajputana West	Rajputana East	Gujarat	Central India West	Central India East	Berar	C. P. West	C. P. East	Konkan	Bombay Deccan	Hyderabad North	Hyderabad South	Mysore	Malabar	Madras South East	Madras Madras	Madras Coast North
1891																										
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the development of transport and communications (so as to open up all areas liable to scarcity and famine and thereby ensure the availability of commercial supplies of food grains); and *Thirdly*, the organisation of efficient administrative arrangements for provision of employment and wages to the landless rural people in those places and at those times when prolonged and severe droughts occurred and they were unemployed and without purchasing power. So much for the counter-checks on one group of natural checks.

The counter-checks devised for dealing with the other natural checks are more obvious. They consisted of hygiene and medicine brought to bear on the problem through departments of public health, and the gradual growth in numbers of the medical profession. There can be no doubt that the counter-checks proved effective and succeeded in eliminating the operation of one of these natural checks and materially diminished the incidence of others.

18. It would, however, be an excessive claim to attribute the whole of this improvement to human intelligence. Nature also seems to have been kinder. Some statistics compiled by the Meteorological Department, which are shown in the diagram facing this page appear to show that as between the two thirty-year periods under study, the earlier period was worse favoured by nature than the later one. Droughts were clearly more frequent and more widespread in the earlier period. The difference is also reflected in the occurrences of excessive rain which not only cause floods but help to start outbreaks of epidemic diseases.

19. The Bengal Famine of 1943, as is well known, marked a tragic reversal of this trend towards elimination of abnormal deaths. The circumstances in which this reversal took place are recorded in the report of a statutory Commission of Inquiry. Relevant extracts from the report of this Commission will be found in APPENDIX IV.

Notwithstanding the very full account given in this report, there is very little public realisation of the fact that the occurrence of this famine marks a new phase in the effort to combat famine in this country.

A basic assumption underlying the classic methods of prevention and relief of famine has been the presence within the country (which formerly included not only India and Pakistan but Burma also) of an overall surplus of foodgrains. The presence of this surplus was a guarantee that commercial supplies of foodgrains would become available at any place and at any time in the quantities needed. A physical shortage of supplies was not a contingency to be

guarded against. So long as the basic assumption remained valid, the old methods which were designed merely to inject purchasing power proved successful in saving life. But the growth of population (induced in part by the success of these very methods) has brought the country and the people face to face with a new situation in which this assumption is no longer valid. The implications of this change are far reaching. Let us note that fact; we shall revert to it later.

20 We may conclude this section with a comparison of the rates* of population growth experienced in India with those of other countries of the world and other times.

The 'mean decennial growth rate' in India, as already explained, was 10.4 per cent in 1921-30, 12.7 per cent in 1931-40, and 13.2 per cent in 1941-50. The last mentioned rate is the difference between a 'mean decennial birth rate' of 40 per cent and a 'mean decennial death rate' of 27 per cent.

The 'mean decennial growth rate' in the United States of America appears to have been 19.0 (1910), 13.9 (1920), 14.9 (1930) 7.0 (1940) and 13.5 (1950). In the United Kingdom, the rate was 9.6 between 40 and 50 years ago and 4.4 during the last twenty years. Recent figures for France indicate a decline; increases were registered during 1921-30 at the rate of about 6 per cent. The figures for Italy yield rates in the neighbourhood of 6, 7 or 8 per cent for several decades. The rates for Japan appear to be running consistently higher than the rates for India—in the neighbourhood of 14 per cent.

In general, Western European rates of growth are distinctly lower than in India even though their death rates are lower than in India. This is due to the fact that Western European peoples practise contraception and thus succeed in keeping the birth rate at a much lower level than ours; though, if they imposed no such checks, their womenfolk are likely to have at least as many children as our womenfolk do have. In the United States of America the people practise contraception. But their birth rate (though distinctly lower than in India) is higher than in Western European countries. Their death rate is very low. In the result, they are keeping up a rate of growth similar to ours and much higher than in Western European countries.

21 This is the position in recent years. It is necessary, if possible, to ascertain how the present total strength of mankind has grown, in order to determine whether there is such a thing as a 'natural' rate of growth. As might

*While great care has been taken to work out these rates from authoritative sources, their accuracy cannot be guaranteed in all cases. The decimal points are refinements which mean very little; the integers may not be too far out.

be expected, we have very little statistical information of the kind we have been discussing so far. Yet, we are not entirely ignorant on the subject; there are a number of books where the results of expert study of all available data about world population are set out. It is true that much of this study consists of piecing together fragments of ascertained fact with a good deal of guess-work. But the guess-work is not arbitrary, it represents the best judgment of scholars who are well qualified to form an opinion and also free from conscious bias. A brief summary of relevant information of this nature is given below.

Round about 1750, the total strength of mankind consisted only of 73 crores of people. Our own number—it will be recalled—is 36 crores today. *Thus two hundred years ago, the whole world contained only twice as many human beings as there are in India alone today*

Out of these 73 crores, only $1\frac{1}{2}$ crores lived in what was then a New World (America and Oceania), $71\frac{1}{2}$ crores of people lived in the Old World—48 crores in Asia, 14 crores in Europe, and $9\frac{1}{2}$ crores in Africa.

Fifty years later (about 1800), the world population had increased to something between 90 and 91 crores. This was a modest rate of growth—only 4·4 per cent per decade. The New World was growing faster—the rate was 12·4 per cent mainly because its growth was being fed by migration from Europe. Asia and Europe grew by 4·5 and 5·7 per cent respectively. It is worth noting that even then, Europe was sending migrants to the New World and yet growing slightly faster than Asia. Africa was not increasing, there was in fact a slight decline in numbers.

Fifty years later (about 1850) the population of the world was nearly 117 crores—the rate of growth was 5·1 per cent per decade. The New World was growing more than three times as fast—15·5 per cent per decade. The tempo of European growth was getting faster—it was now 7·0 per cent against Asia's 4·4 per cent. Africa, too, was beginning to add to its population, though at a very slow rate—1·8 per cent.

After another fifty years (about 1900), the population of the world was 161 crores. The rate of growth shows a definite sign of acceleration, the world average rate was now 6·3 per cent per decade. It is, however, still the New World and Europe moving ahead—the former was growing at the rate of 16·8 per cent per decade and the latter at 8·1 per cent. Asia stayed behind with 4·5 per cent, but Africa had now caught up to that rate.

When the present century opened, the distribution of world population had changed as shown in TABLE 5 on next page.

TABLE 5

Country	1750		1900	
	Number (IN CRORES)	Percentage of world population	Number (IN CRORES)	Percentage of world population
Africa	9.5	13	12.0	8
Asia	47.9	66	93.7	58
Europe	14.0	19	40.1	25
New World	1.4	2	15.0	9
WORLD TOTAL . .	72.8	100	160.8	100

The population of Europe and the New World had grown from being about one-fifth of the world population in 1750 to about one-third in 1900. The population of Asia and Africa had also grown in absolute numbers; but since their rates of growth were so much slower than in Europe and the New World, their relative proportion diminished from about four-fifths to two-thirds.

This was the position in or about 1900. During the last fifty years the practice of contraception has grown, and become part of the normal mode of conjugal life among the majority of the people in Western Europe and people of their stock inhabiting the New World. As a result, their birth rates have been falling fast. Their death rates had already begun to fall much earlier during the last century. This was the result partly of the fact that the masses of the people had begun to eat more food and better food than they had ever known before, and partly of the fact that water supply and sanitation, hygiene, and medicine had begun to make progress. So long as the birth rates remained stationary while the death rates fell, the growth rate was well ahead of the rest of the world. Hence the difference in the figures of Asia and Europe already observed. But when the European peoples started contraception and the habit grew, the birth rates fell faster than the death rates—with the result that the European rate of growth has been falling. During the last half-century the mean decennial growth rate of Europe has been 6.0 per cent per decade; while that of Asia is higher, *viz.*, 6.8. Africa has forged ahead with 9.3 while the rate in the New World has dropped from 16.8 to 15.1.

The latest position (round about 1950) seems to be as follows. World population is now 239 crores—well over three times the number of 1750. Europe and the New World have about 88 crores which is well over a third of

the population of the world. Asia and Africa have 151 crores which is well below two-thirds of the population of the world. If the trends of the last fifty years continue to operate during the next fifty years, the numbers of the European peoples should become stationary (if not declining) and Asia and Africa should keep growing even faster than at present—the rate of growth in the New World falling to the same level. But, there are good reasons to think (as will appear later in this report) that the ‘if’ is a very big one, and the assumption is unlikely to hold good.

22 In the account given above, it has been asserted that the decline during the latest half-century of the rate of growth of Western European peoples and people of the same stock in the New World—which is an observed fact which admits of no doubt—has been caused by the development of the practice of contraception. Until recently, this statement—though widely suspected to be probably true—could not be regarded as firmly established by adequate evidence. During the thirties, a theory was in vogue : that the observed fall in the birth rate was a biological phenomenon— independent of conscious human volition. There was, it was asserted, a law of nature which induces a fall in the birth rate among people who achieved rising standards of living. Even now one still comes across this idea, in some form or other. But it is no longer necessary to invoke an unproved biological law in order to explain something which needs no further explanation, if the practice of contraception can be demonstrated to be both widespread and effective. This demonstration is now available. The Royal Commission on Population in the United Kingdom has collected and analysed a mass of evidence and the findings of that Commission are conclusive. Relevant extracts from the papers of this Commission will be found in APPENDIX VII. The findings of the Commission confirm (what is also indicated by a good many other enquiries conducted in the United States of America and certain Western European countries) that the practice of contraception by sufficiently large numbers of people is the main operative cause of falling birth rates. They also indicate that the alleged biological law is unlikely to be true and that an improvement of the nutritional standard or other standards of living is by no means incompatible with the maintenance of a high rate of child-bearing, if the people so desired.

23. One more comment is necessary on the figures showing the rate of growth of population in different parts of the world. It may be agreed that *an increase of population of the order of between 10 and 15 per cent per decade is biologically natural* and has been experienced by many of the advanced countries of

the world and is still experienced by some of them. Whether or not this can continue indefinitely in future is a question of high importance for mankind as a whole. The question is at present involved in acute controversy into which we need not enter at this stage. One thing, however, is certain. It could not have been a normal characteristic of human history for an indefinite period in the past.

Within the last two hundred years mankind has more than trebled its numbers—and this has happened while the rate of growth per decade was very much less than 10 per cent. We can easily see that even the rate which actually prevailed during the last two centuries—trebling in two centuries—must be regarded as abnormal and very much faster than in preceding centuries. On any other supposition, we must be led to the conclusion that, when Emperor Asoka ruled (273–232 B.C.), and was sending his missionaries to various countries of the world, the whole of mankind must have numbered only a few tens of thousands—which is absurd.¹ We shall not see the picture of human growth in its proper perspective unless we realise that *what we feel to be a 'biologically natural' rate of growth is by no means natural in the sense of having regularly occurred at all places from time immemorial. The exact opposite is nearer the truth.* The rates of growth which we are discussing should, therefore, be regarded as an episode in an altogether exceptional epoch in human history. This epoch is probably now drawing to its close. With this observation, we may leave the world figures alone for a while; and return to India and limit ourselves again to a review of changes which occurred during a much shorter period—viz., thirty years before and since 1921.

B — *Decline of Cultivation per capita*

THE OBJECT of this section is to analyse the growth of population during the last sixty years in relation to the growth of cultivation during the same period. It is, nowadays, generally agreed that cultivation has been failing to keep pace with population—but the extent of this default has not been assessed quantitatively. So long as the matter remains vague, there is a tendency to refrain from facing or accepting the implications of that fact, and it is not unusual to find people denying the fact altogether, when they find its acceptance leads to unpalatable conclusions.

DECLINE OF CULTIVATION PER CAPITA

25. It is not the least difficult among many baffling problems which Governments have to face in recent years, that they are frequently obliged to make decisions of far-reaching import, vitally affecting the economic and social life of the people ; and yet they have to do this on the basis of data which are of uncertain accuracy, incomplete and consequently inconclusive for purposes of resolving differences of opinion objectively. In the result, there is great temptation for people to believe the facts to be what they would like them to be. Contrary to general belief, this situation is not peculiar to India. It is prevalent, to a greater or lesser degree, in every country in the world. In general, the change-over from *laissez faire* to economic and social planning has been too rapid for the statistical systems adequate to the former, being satisfactorily developed and adapted to meet the needs of the latter. These difficulties should be neither underrated nor overrated. They merely mean that we have to grope our way for a time, before we improve the system of statistical intelligence adequately. It is not as if it is altogether impossible to find the right way even in our semi-darkness. For this purpose, we can and should make much better use of the statistics which we possess and which we can increasingly procure as we go along facing and solving our problems. In particular, we should do well to refrain from indiscriminate self-condemnation just as much as uncritical laudation. Strange as it may seem, it is true that in some respects we are even better equipped with good statistics than a great many other countries of the world. In other respects, much improvement can be secured merely by a systematic endeavour critically to assess the degree of goodness and badness of our statistics, and effecting careful separation of the grain from the chaff.

26. These preliminary observations of a general nature are necessary in order to introduce the data relating to 'population and land use' which are printed as APPENDIX I.

An introductory note will be found among these papers where a full explanation is given of the sources from which the data were secured, the care taken to scrutinize and sift them, and the extent to which useful and reliable data are in fact available.

Statistics of land and of its cultivation are of as great importance as statistics of the people and their birth, death and growth. Cultivation statistics fall into two parts— those relating to acreages and those relating to yields. Just as our census statistics are of better quality than our statistics of births and deaths, so also our statistics of cultivated acreages are very much better than our statistics of the yield of crops. Not all parts of the country are equally well-equipped

with good acreage statistics. It can, however, be said that over the greater part of India acreage statistics are probably as good as the very best in the world. Among the areas for which acreage statistics of good quality are available, not all possess a continuous series over a sufficiently long period of years. It is, however, possible to select the areas for which comparable statistics of good quality are procurable for the sixty-year period with which we are concerned in this chapter. The figures which are now to be presented relate to areas which were selected solely from this point of view and no other.

27 Districts under study—The figures relate to all the districts of eight natural divisions and some of the districts of five other divisions. Nearly 12 crores of the people of India live in this territory, and their distribution by zones is given below :

North India . East Uttar Pradesh Plain, Central Uttar Pradesh Plain, parts of West Uttar Pradesh Plain and Uttar Pradesh Hills and Plateau (1951 Population—591 lakhs).

South India : Madras Deccan, West Madras, Mysore, and parts of South Madras (1951 Population—300 lakhs).

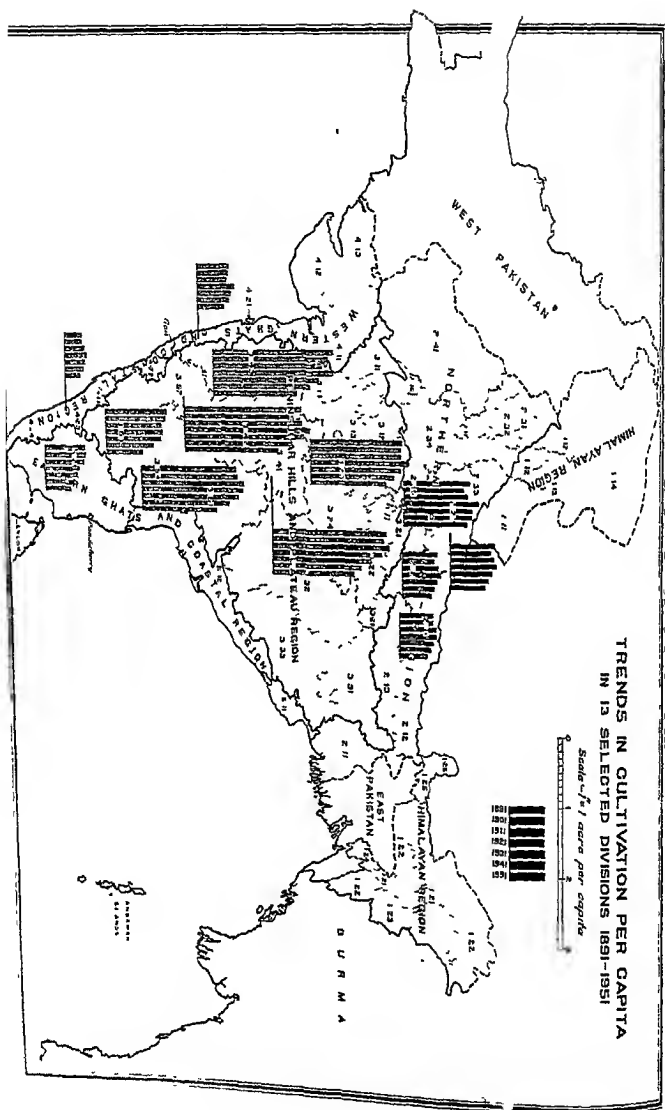
West India : Bombay Deccan Southern, parts of Bombay Deccan Northern and Bombay-Konkan (1951 Population—177 lakhs)

Central India North-West Madhya Pradesh and South-West Madhya Pradesh (1951 Population—110 lakhs)

In 1891, the population of all these districts was 815 lakhs. It increased to 833 lakhs in 1921, the rate of growth during 1891-1920 being 0.7 per cent per decade. It has since increased to 1,179 lakhs in 1951—the rate of growth during 1921-50 being 11.5 per cent per decade [For the country as a whole, it will be recalled the rates of growth were 1.7 per cent per decade in the earlier period and 12.0 per cent per decade in the later period]

28 Area of cultivated land per capita — ALL AREAS — It is generally known that the net area of land on which some crop or other is raised, fluctuates from year to year—increasing when the rainfall is adequate and timely and decreasing when it is inadequate or untimely. In order to obviate or at any rate reduce the errors which would arise by comparing good years with bad ones, the average area of cultivated land during a consecutive period of five years next preceding each census year has been computed

It is found that the area of cultivated land in the districts which we are studying was 890 lakhs of acres in 1891. It fell to 840 lakhs in 1901 (thus reflecting the effects of the famines we have noted already) and then rose to 915



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lakhs of acres in 1911. Further growth of acreage of net area sown is as follows: 927 lakhs in 1921, 943 lakhs in 1931, 958 lakhs in 1941 and 991 lakhs in 1951. If we divide the area of cultivated land by the population at each census—we obtain a figure showing the 'area of cultivated land *per capita*'. If this figure remains the same from census to census, then the increase in the area of cultivated land has kept pace with the increase of population. If it fell from census to census, then it means that the former is not keeping pace with the latter; and (other things being equal) the share of food and other produce of cultivation available to each individual is diminishing. The results for the districts under study are shown in

TABLE 6

Census year	Area of cultivated land <i>per capita</i> (IN CENTS)
1891 . . .	109
1901 . . .	103
1911 . . .	109
1921 . . .	111
1931 . . .	104
1941 . . .	94
1951 . . .	84

TABLE 6

It will be seen that during the first thirty-year period, the area of cultivated land *per capita* moved up and down slightly and was a little higher at the end than at the beginning. The second thirty-year period presents a very different picture—the area dropped steadily from census to census. It came down from 111

cents to 84 cents. The magnitude of this drop is very substantial—nearly one-quarter of the 1921 level.

29. *Area of cultivated land per capita*—UTTAR PRADESH—The districts under study have a total population in 1951 of 591 lakhs against 632 lakhs for the zone. The coverage is thus very extensive. We find that the area of cultivated land was 329 lakhs of acres in 1891. It fell to 313 lakhs in 1901, rose to 333 lakhs in 1911 and 337 lakhs in 1921. Then the acreage dropped to 332 lakhs in 1931, rose to 346 lakhs in 1941 and then by a further big spurt rose to 362 lakhs in 1951. Having regard, generally, to the progress of cultivated acreages, this was good going. But in relation to the rate of growth of population between 1921 and 1950, it was not. The area of cultivated land *per capita* changed* as follows: 74 cents in 1891, 69 cents in 1901, 75 cents in 1911, 78 cents in 1921, 72 cents in 1931, 66 cents in 1941 and 61 cents in 1951.

*As explained in Chapter I, we must not be misled by differences in the area of land *per capita* in two different parts of India, into thinking that the larger area is necessarily capable of yielding more food. But when we are considering the same part of the country at different periods of time, the change in the area from decade to decade does signify—in the absence of more intensive cultivation—a corresponding diminution of food and other produce of cultivation.

The trend in the four different divisions of this zone is shown in TABLE 7.

TABLE 7

Natural division	Area of cultivated land per capita (IN CENTS)		
	1891	1921	1951
East Uttar Pradesh			
Plain	64	67	53
Central Uttar Pradesh			
Plain	65	72	55
West Uttar Pradesh			
Plain	82	84	65
Uttar Pradesh Hills & Plateau	124	141	118

It will be observed that the area of cultivated land *per capita* was slightly higher everywhere in 1921 than in 1891. In 1951 it has dropped everywhere. The magnitude of this drop is between one-fifth and one-fourth of the 1921 level in the three plains divisions. It is somewhat smaller—about one-sixth of the 1921 level—in the hills and plateau division.

30. *Area of cultivated land per capita*—MADRAS-MYSORE—Here,

it was found necessary to omit the whole of North Madras and the greater part of South Madras— even though the areas involved are very large and excellent acreage statistics are available for them; and even though the remaining areas are not quite typical of South India as a whole. But the omission was necessary because *zamindari* villages lie interspersed with *rayatwari* villages in most of these districts and they did not acquire proper statistics until after 1911. So the districts under study comprise only a population of 300 lakhs, against the zonal total of 756 lakhs. The coverage is relatively small and, as indicated already, not altogether typical of South India. Such as they are, the figures yield the following story. The area of cultivated land was 186 lakhs of acres in 1891. It rose to 192 lakhs in 1901. [It will be recalled that the famines of the last decade (1891-1900) were not severely felt in this part of India. Some of these areas had suffered severely in a still earlier decade and one (lying in the brown belt) is accustomed to droughts and failure of crops recurring at more or less regular intervals.] The rise continued to 204 lakhs in 1911. Then there was a drop to 202 lakhs in 1921, followed by a rise to 209 lakhs in 1931. This again rose to 210 lakhs in 1941 and dropped to 204 lakhs in 1951. It appears that cultivation had become virtually stationary at the 200 lakhs acre level; such changes as occur represent only the fluctuations of the seasons. It is noteworthy that both in 1931 and in 1941, the five-year average should be somewhat higher than in 1951 and 1921. In both of these terminal periods there are well authenticated reports of an abnormal succession of seasons of inadequate rain.

A stationary level of cultivation involves the consequence that the entire increase of population will be translated into a steep decline of the area of

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cultivated land *per capita*. Hence the following figures for the latter: 102 cents in 1891 and 1901, 101 cents in 1911, 96 cents in 1921, 91 cents in 1931, 82 cents in 1941 and 68 cents in 1951.

The trend in the different divisions is shown in TABLE 8. South

TABLE 8

Natural division	Area of cultivated land per capita (IN CENTS)		
	1891	1921	1951
South Madras	80	68	49
West Madras	36	44	32
Madras-Deccan	184	197	147
Mysore	120	105	70

Madras and Mysore show a drop even during the first thirty-year period. All the four divisions show very substantial drops during the second thirty-year period. The drop in the later period varies in the three Madras divisions from 25 to 28 per cent of the 1921 level; while in Mysore, it is as much as 33 per cent of the 1921 level.

31. *Area of cultivated land per capita* — BOMBAY — The districts under study have a total population in 1951 of 177 lakhs against a total of 407 lakhs in West India. A sizeable proportion is covered — but the areas excluded (Bombay-Gujrat, Saurashtra and Kutch) are not similar to the areas covered.

The area of cultivated land was 212 lakhs of acres in 1891. It dropped heavily to 187 lakhs in 1901 — for these areas suffered severely from famine. It recovered to 205 lakhs in 1911 and there has been a steady growth since then to 217 lakhs in 1921, 228 lakhs in 1931, 233 lakhs in 1941 and 260 lakhs in 1951. Nevertheless, this growth has fallen far short of the growth of population since 1921. The area of cultivated land *per capita* changed as follows: 201 cents in 1891, 187 cents in 1901, 188 cents in 1911 and 205 cents in 1921. Then, a steady decline to 188 cents in 1931, 171 cents in 1941 and 147 cents in 1951.

The trend in different divisions is shown in TABLE 9. The drop from 1921

TABLE 9

Natural division	Area of cultivated land per capita (IN CENTS)		
	1891	1921	1951
Bombay Deccan Northern	230	226	159
Bombay Deccan Southern	226	243	180
Bombay-Konkan	62	72	50

to 1951 is quite substantial in all the three divisions — being 30, 26 and 31 per cent respectively of the 1921 level.

32. *Area of cultivated land per capita* — MADHYA PRADESH — Only two divisions of Madhya Pradesh are considered in this very extensive zone. The total popula-

tion in 1951 is 110 lakhs against the zonal total of 523 lakhs.

In 1891, the area of cultivated land was 163 lakhs of acres. It dropped to 149 lakhs in 1901— this reflects the severity of famine. Then the acreage rose to 175 lakhs in 1911, fell slightly to 171 lakhs in 1921, rose again to 174 lakhs in 1931, declined to 169 lakhs in 1941 and has further declined to 165 lakhs in 1951 (which is not much above the 1891 level). This is somewhat exceptional experience. The general rule is for some growth to be kept up—even if it be modest and far short of the rate at which population is growing. It is not altogether clear why an absolute decline should have occurred— seasonal conditions seem unlikely, wholly, to explain it.

The result is that the area of cultivated land *per capita* was more or less stationary during the first thirty-year period— 196 cents in 1891, 191 cents in 1901, 198 cents in 1911 as well as 1921; and has then steadily declined to 181 cents in 1931, 164 cents in 1941 and 149 cents in 1951.

The two divisions show slightly different features. In North-West Madhya Pradesh the area rose from 173 cents in 1891 to 185 cents in 1921 and has since fallen to 143 cents in 1951. The drop is 23 per cent of the 1921 level. In South-West Madhya Pradesh, there was a small drop even in the first period from 220 cents in 1891 to 211 cents in 1921 and has since dropped heavily to 156 cents in 1951. The latter drop is 26 per cent of the 1921 level.

33 *Intensification of cultivation versus extension*— The facts reviewed so far leave no room for doubt that there has been such a drop in the area of cultivated land *per capita* during the thirty years since 1921, that (other things being equal) every man, woman and child must expect to get distinctly less food and other agricultural produce from the land at the end of the period than at the beginning. The magnitude of the drop—as we saw—is about one-sixth in only one division of Uttar Pradesh, between one-fifth and one-fourth in three divisions of Uttar Pradesh, and well in excess of one-fourth elsewhere.

We shall follow up the implications of a drop in the productivity of cultivation *per capita*. Here we should clear up, as far as possible, the connection between a drop in the area of cultivated land *per capita* and a drop in the productivity of cultivation—for the two things are not identical. It is obvious that a drop in the area of cultivated land *per capita*, from say 72 cents to 55 cents (such as has occurred in Central Uttar Pradesh Plain), need not necessarily entail a drop in production of crops of the same order (24 per cent) or even any drop in production at all in certain circumstances. In theory it is possible that more intensive cultivation could have been practised so that the yield per acre increased in 1951 by 24 per cent as compared with the yield per acre in 1921. Now, the statistics of yield per acre are much more open to controversy than the

statistics of acreage; and having taken all this trouble to arrive at valid conclusions on the basis of convincing statistics, we should not (in this chapter at any rate) get involved in controversies.

Let us consider the different ways in which an increase in the yield per acre can be brought about. One way is for two or more crops to be raised on the same land in the same year, where only one was raised before. Another is for an irrigated crop to be raised, where the crop was formerly unirrigated. A third method is for more manures and fertilisers to be used on the same area of land. A fourth way is to use better seed, use more appropriate methods, and devote greater care and attention to seed-beds, seedling and the growing plant.

Let us call these four methods more double-cropping, more irrigation, better fertilisation and better culture. It is very difficult to measure the last two items, quantitatively. Even if this may be possible in future we have got very little of quantitative data for the past, in respect of manuring of land or the efficiency of husbandry. But we do have data about the first two in terms of double-crop acreages and irrigated acreages. In other words, a part of the process of intensification of cultivation (very probably the most important part) is reflected in acreage statistics in just the same way as extension of cultivation. It can therefore be studied in the same way. If we find that the double-crop area and irrigated area increased at a faster rate than the growth of population—so that they could have offset the effect of the area of cultivated land lagging behind the growth of population—then all would be well. If we do not find this, then we would have gone a long way near measuring *the decline in the productivity of cultivation per capita*, as distinguished from the *area of cultivated land per capita*.

34. *Double-crop area per capita*—The gross area sown less the area of cultivated land (or net area sown) may be referred to as the 'double-crop area'. In 1891, this was 99 lakhs of acres in all the districts under study. About 10 per cent of the area of cultivated land at that time was double-crop area. By 1921, the double-crop area rose to 109 lakhs of acres which was nearly 12 per cent of the area of cultivated land at the time. In other words, the first thirty-year period saw double-cropping increasing at a slightly faster rate than cultivated land. The growth of population had been slower than both. By 1951, the double-crop area had increased to 125 lakhs, which is nearly 13 per cent of the area of cultivated land. The double-crop area has grown during the second thirty-year period, a shade faster than the area of cultivated land—but nowhere near the rate of growth of population.

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When these areas are divided by the population figures, we get the double-crop area *per capita* as follows : 12 cents in 1891, 13 cents in 1921, and 10 cents in 1951. The table below shows that the picture is much the same in all four zones.

TABLE IO

	Double-crop area per capita (IN CENTS)		
	1891	1921	1951
North India districts	18	19	15
South India districts	7	8	7
West India districts	4	5	4
Central India districts	4	5	6
ALL DISTRICTS UNDER STUDY	12	13	10

35 *Irrigated area per capita*—The total area irrigated (reckoning the irrigation of two successive crops in the same year on the same land twice) was 128 lakhs of acres in 1891. This was 12.9 per cent of the gross area sown at the time.

In 1921, the irrigated area had risen by 24 lakhs to 152 lakhs of acres. The increase was faster than the increase in the gross area sown for the percentage was now 14.7 against 12.9 in 1891.

In 1951, the irrigated area had further risen by another 17 lakhs to 169 lakhs of acres. The increase in the irrigated area was a shade faster than the increase in the gross area sown and the percentage now stood at 15.1. When we divide the irrigated area by the population and trace the changes in irrigated area *per capita*, the result is as follows. The areas under study had 16 cents of irrigated land *per capita* in 1891. This rose to 18 cents in 1921. It stands at 14 cents in 1951.

The following table shows the position in different zones.

TABLE II

	Irrigated area per capita (IN CENTS)		
	1891	1921	1951
North India districts	19	25	19
South India districts	18	16	14
West India districts	7	8	8
Central India districts	2	2	2
ALL DISTRICTS UNDER STUDY	16	18	14

36 We may now sum up the results of our study of the selected districts in which some 12 crores of the people of India live. The following conclusions are established :

- I— Just as there is a sharp contrast between the growth of population during two thirty-year periods before and after the 1921 Census, there is an equally sharp contrast in the relationship of this growth to the growth of cultivation
- II— This relationship may be expressed in three factors— the 'area of cultivated land *per capita*', the 'double-crop area *per capita*' and the 'irrigated area *per capita*'. *The contrast between the two thirty-year periods consists in this. Each of these three factors changed but little during the first thirty-year period. Each was a little higher in 1921 than in 1891. During the second thirty-year period, however, every one of these three factors declined steadily and was substantially lower in 1951 than in 1921.*
- III— The drop between 1921 and 1950 has been heaviest in respect of the area of cultivated land— it is not far short of one-quarter of the 1921 level. The double-crop area and the irrigated area increased somewhat faster than the area of cultivated land, but very much less fast than the increase of population. The aggregate of all three factors has also dropped heavily between 1921 and 1950, and the drop is not very far short of three-quarters of the 1921 level.
- IV— With unessential variations, these features are reproduced in every division. The drop is less heavy in the North— nearer one-fifth than one-fourth, and is correspondingly heavier in the south and west. In some parts of the country, the decline had started earlier than 1921— the 1921 level of the *per capita* factors being even lower than in 1891. *But the steady decline of all the factors during three decades since 1921 is an all-pervasive fact.*

37 In making this study we have had to restrict ourselves to one-third of the population mainly because it was necessary to cover two thirty-year periods on a continuous and comparable basis. If we restrict ourselves only to the second thirty-year period 1921–50, it is possible to provide reliable data for a much larger territory.

It is unnecessary to recount all the relevant figures which will be found in APPENDIX I. The net result of the comparison is set out

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in the table below, which shows all the three *per capita* figures for both 1921 and 1951, in 19 divisions of 6 states where over 19 crores of people live :

TABLE 12

State and division	(INCENTS)					
	Area of cultivated land per capita		Double-crop area per capita		Irrigated area per capita	
	1921	1951	1921	1951	1921	1951
Madras						
Madras Deccan . . .	197	147	8	8	16	14
West Madras . . .	44	32	11	8	..	
North Madras . . .	78	56	17	12	32	27
South Madras . . .	65	44	9	7	19	17
Mysore	105	70	4	5	16	13
Madhya Pradesh						
North-West Madhya Pradesh	185	143	9	11	2	3
East Madhya Pradesh . .	138	113	33	33	12	20
South-West Madhya Pradesh	211	156	1	2	2	2
Uttar Pradesh						
Himalayan Uttar Pradesh .	60	72	14	12	10	7
East U P Plain . . .	67	53	21	17	25	17
Central U P Plain . . .	72	55	19	14	25	16
West U P, Plain . . .	84	65	18	15	27	21
U P Hills & Plateau . . .	130	112	16	14	13	15
Punjab						
Himalayan Punjab . . .	62	49	33	28	22	18
Punjab Plain . . .	121	99	25	18	37	40
Bombay						
Bombay Deccan Northern .	225	151	7	5	10	10
Bombay Deccan Southern	243	180	2	4	6	7
Bombay-Gujrat . . .	141	114	7	4	5	4
Bombay-Konkan . . .	68	48	3	2	2	1

It will be observed that Himalayan Uttar Pradesh (a small area with a quarter crore of population) presents the only exception to the general rule and shows a small increase in the area of cultivated land *per capita*. In every other

Interesting figures regarding the growth of cultivation in the United States of America have been collected and included among the papers in APPENDIX I.

TABLE 14

Year						Crop land per capita in U S A (IN ACRES)
1850	.	.	.	.	.	3 3
1860	.	.	.	.	.	3 5
1870	.	.	.	.	.	3 2
1880	.	.	.	.	.	3 8
1890	.	.	.	.	.	3 9
1900	.	.	.	.	.	4 2
1910	.	.	.	.	.	3 8
1920	.	.	.	.	.	3 8
1925	.	.	.	.	.	3 4
1930	.	.	.	.	.	3 4
1935	.	.	.	.	.	3 3
1940	.	.	.	.	.	3 0
1945	.	.	.	.	.	2 9
1950	.	.	.	.	.	2 7

TABLE 14 shows the extent of 'crop land *per capita*' in that country during one hundred years ending 1950.

It is worth noting that there is a marked contrast between the trend of the last thirty years and the trend in preceding decades ; and that the area of crop land *per capita* has dropped in the United States from 3·8 acres in 1920 to 2·7 acres in 1950—or round about one-quarter of the 1920 level

Is the decline of cultivation per capita tending to become a feature of the economy of the world as a whole ? Our figures do not answer this question. But they raise it quite clearly. If further study of world data yields an affirmative answer to this question, we may be sure that

we are passing through the last stage of that exceptional phase in the growth of mankind in numbers which was introduced mainly by the opening up of the New World and partly by the creation of a world market

C — Changes in the Livelihood Pattern

IN THE two previous sections of this chapter we have been able to establish, with the help of convincing statistics, two facts of outstanding importance.

The first is : Population has been growing during the last three decades both rapidly and uninterruptedly—in this, presenting a sharp contrast with three earlier decades when the growth was slow and interrupted. We also identified the reason for this contrast. It was not due to any abnormal change in the

child-bearing habits of our people. Nor did it arise from sensational decrease in the numbers of what may be called normal deaths though some decrease of this nature has probably taken place. For all practical purposes, however, the contrast is due to substantial elimination during 1921-50 of what may be called abnormal deaths caused by famine and pestilence during the decades preceding 1921.

41. *The second* outstanding fact which has been definitely established relates to the progress of cultivation. There has been some progress of cultivation of a more or less steady nature—throughout this period—if this progress is measured in absolute terms by three indices, *viz.*, the area of cultivated land, the double-crop area and the irrigated area. But when we measure this progress relatively to the growth of population, we are again presented with a contrast of the same nature as that of the growth of population. The three indices of cultivation *per capita* have, severally as well as in the aggregate, declined steadily during the last three decades; while they had remained substantially constant or had slightly risen during the three earlier decades.

These facts, it should be emphasized, are not limited to any particular part of the country. *They are pervasive characteristics of the life of the people in almost all parts of the country.* The exceptions to the rule, if any, are insignificant.

42. It is obvious that vital changes of this character must have had a profound influence on the manner in which the people live and earn their livelihood. These changes might not necessarily be of an adverse nature, if industries and services other than cultivation had grown during the last three decades at such a fast rate as to provide gainful employment not only for all the increased numbers among those formerly engaged on such industries and services (the non-agricultural classes), but the very much larger number who had come into being among the agricultural classes.

Historically, it is well known that this was the trend of change which took place in Western European countries during the last century. It was also the change which is being brought about during the last three decades in Soviet Russia by deliberate policy and planning.

Is that what has been happening in India? It is, of course, a matter of general knowledge and common experience that many new developments have taken place during the last 30 years which were undreamt of in the earlier period. Many new enterprises have been started in various branches of manufacturing industries. Many products of industry formerly unknown in the villages have now become articles of household use for increasingly large numbers

of villagers. Transport in varied forms, has developed conspicuously. New towns have sprung up and old towns have greatly increased in numbers. Schools have been increasing, literacy growing and the numbers of people engaged in many different professions seem to be everywhere increasing. The signs are also unmistakable of a quickening of the tempo of these changes within the last ten years—during and since World War II. One hears so often of the continued overcrowding of trains and buses, cinemas and other places of recreation are full to overflowing, and there is an ever-increasing demand for admission to schools and colleges, with which existing institutions are unable to cope.

43 All this, however, is far from being a complete answer to the question we have posed. This question is essentially quantitative. It is not sufficient to say that gainful employment in industries and services has increased. It is not even sufficient to say that the rate of growth of industries and services has not fallen short of the rate of growth of the population (assuming that this statement is true). What is required is such a change in the numbers as would enable us to conclude that *the development of industries and services has proceeded fast enough to offset the decline of cultivation per capita during the last three decades.*

It is unfortunately not possible to clinch the answer to this question one way or the other conclusively by statistics. Our data relating to industries and services are by no means comparable with the cultivation statistics set out in the last section. They do not also go back far enough on a comparable basis.

44 At first sight it would seem that the census data should suffice to separate the growth of population in villages from the growth of population in towns and thus might go a long way to answer the question. The relevant information is given in the table below :

TABLE 15

Census year	Population (IN LAKHS)		Growth (IN LAKHS) during the preceding decade		Rate of growth during the preceding decade	
	in villages	in towns	in villages	in towns	in villages	in towns
1921	2 199	282				
1931	2,420	334	+221	+ 52	+10.1	+18.4
1941*	2,710	438	+290	+104	+12.0	+31.1
1951	2,950	619	+240	+181	+ 8.9	+41.3

* Actual figures of 1941 Census count and Punjab. No allowance made for inflation of returns in West Bengal.

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These figures show clearly that the rate of growth in villages is lower than in towns—the difference being accounted for by migration from villages to towns.

Among the towns themselves it seems, in general, likely that the cities and major towns tend to grow more rapidly *and the rate of growth shows clear signs of acceleration*. Thus, the ten largest cities added over half-a-crore to their population during the decade immediately before the 1951 Census. The addition during the preceding decade (1931-40) had been less than one-third of a crore. Even this was nearly twice as large as the addition which had taken place during a period of 30 years preceding the 1931 Census. The figures for these cities (on a town-group basis) are given below

TABLE 16

Town group	(IN LAKHS)			
	Population 1951	Additions to population during		
		1941-50	1931-40	1901-30
Greater Calcutta	45.8	*	*	6.0
Greater Bombay	28.4	11.4	3.9	4.6
Madras	14.2	6.4	1.3	1.4
Delhi	13.8	7.2	2.2	2.3
Hyderabad	10.9	3.5	2.7	0.2
Ahmedabad	7.9	2.0	2.8	1.3
Bangalore	7.8	3.7	1.0	1.5
Kanpur	7.1	2.2	2.4	0.4
Poona	5.9	2.4	0.8	0.9
Lucknow	5.0	1.1	1.1	0.2

45. These figures are striking and they confirm the general impression one forms by observation of city life of a greatly increased volume of non-agricultural avocations. They are, however, misleading if accepted as an indication of the change in the life of the people as a whole. For it will be noticed that the growth of rural population during the last three decades though smaller than that of towns is nevertheless quite large. There is little doubt that the rate of growth of rural population has substantially out-stripped the rate of progress of cultivation. Has there been a growth of rural industries and services on a scale sufficient to offset this difference—or indeed to any extent at all? It seems very

*According to census data the growth of population in Greater Calcutta was 14.6 lakhs during the 1931-40 and 10.4 lakhs during 1941-50. They have not been shown separately against Greater Calcutta because it is known that there was over-enumeration and consequent inflation of the 1941 Census figures.

unlikely, though we cannot support a definitive answer conclusively by statistics.

46. Even though a conclusive answer may not be furnished it is necessary that available data should be examined with full comprehension of the difficulty in drawing inferences from them and such indications as they provide should be noted.

The economic data yielded by the Censuses of 1931 and 1951 have been analysed in order to set up such comparisons as appear reasonably possible and valid. There are difficulties arising out of small but significant changes in definitions and classifications. There are also other difficulties necessarily inherent in any such enquiries carried out on a mass scale over a sub-continent. A full account of these matters will be found in the papers printed as APPENDIX III. The conclusions recorded at the end of this paper are reproduced below :

- I—During the twenty years following 1931, population grew faster than cultivation. The area of cultivated land *per capita* is known to have declined significantly in Uttar Pradesh, Bihar, Orissa, Assam, Madras, Mysore, Travancore-Cochin, Bombay, Madhya Pradesh and Punjab. There is little doubt, that if correct figures of cultivation had been available for other states a similar decline would have been observed in all of them.
 - II—Notwithstanding such decline in the area of cultivated land *per capita*, the relative weight of dependence on agriculture for gainful employment has not declined in the country as a whole. It is probable that it has increased slightly. Such increase is observable in Uttar Pradesh, Bihar, Orissa, Assam, Madras, Hyderabad, Rajasthan and Punjab. Dependence on agriculture has not changed in Madhya Pradesh. It has probably diminished in Bombay, West Bengal and Mysore.
 - III—The main reaction to this general decline in the area of cultivated land *per capita*, unaccompanied by a more than proportionate increase in non-agricultural employment, has been a general increase of non-earning dependency. The increase in absolute numbers of non-earning dependants has exceeded the entire increase of rural population in India, as well as in each of five zones out of six.
- The percentage of non-earning dependants to the general population has increased in every major state except Bombay, West Bengal and Punjab. It has decreased slightly in Bombay and West Bengal; and is practically unchanged in Punjab.

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The increases in the percentages are not accompanied by any material change in sex ratio or age structure. They must, therefore, be regarded as a rough index of the growth of unemployment in different parts of the country.

IV— There has been a general increase throughout the country in the number of cultivators and cultivating labourers (including unpaid family helpers) working on the same area of cultivated land— say 100 acres. The increases are relatively small in the following states : Assam (46 to 48), Bihar (50 to 52), Uttar Pradesh (49 to 51), Madras (34 to 36) and Orissa (29 to 32).

Larger increases are observed in the following states : Punjab (23 to 26), Bombay (17 to 23), Madhya Pradesh (26 to 33) and Travancore-Cochin (41 to 57).

Among the major states for which figures are available, Mysore alone shows a fall in this number (32 to 26).

The figures of increase in the number of workers provide rough indication that under-employment is growing on the land, but the picture is somewhat blurred by uncertainty about the role of unpaid family helpers in the cultivation of land.

V— Material changes have occurred in the percentage of cultivating labourers to all workers in land (*i. e.*, cultivating labourers and cultivators including their unpaid family helpers). There is only one major state where this percentage has increased— Travancore-Cochin (34 to 47). The percentage has remained practically unchanged in Bihar (27-26), Mysore (13-14), Hyderabad (31) and Punjab (11-12).

In other states the percentage has fallen : Uttar Pradesh (18 to 9), Orissa (30 to 19), West Bengal (40 to 28) Madras (38 to 35), Bombay (43 to 18), Madhya Pradesh (43 to 32) and Rajasthan (11 to 4).

The fall in the percentage of cultivating labourers is the natural result of increase in the number of cultivators and members of their families occupying the same area of cultivated land. The cultivators' need for employing labourers diminishes, as also their capacity to pay for their services.

It is clear, however, that this is not the sole cause of the fall in the proportion of cultivating labourers. There are reasons to

believe that in various parts of the country, there were considerable number of people who were in fact cultivators but not acknowledged as such in order to guard against the accrual of occupancy rights in land. There were probably also other people who partook of the characteristics of both cultivators and cultivating labourers and whose classification was open to genuine doubt. As a result of the operation of tenancy legislation (old and new) as well as the general change in the social climate, it is likely that a 'conversion' has taken place between 1931 and 1951 of many such people from the status of cultivating labourers to cultivators. Such 'conversion' probably accounts for an important part of the fall in the proportion of cultivating labourers observed in Bombay, Madhya Pradesh, Uttar Pradesh, Rajasthan and possibly also elsewhere. While there is little doubt about the fact that the proportion of cultivating labourers has fallen and the fall is explainable by the two reasons mentioned above, there are puzzling variations in the nature of the changes which have taken place in different states.

VI— There is a complex inter-relationship between the nature and magnitude of changes of the following description (all of which occurred between 1931 and 1951)—the intensity of the decline of the area of cultivated land *per capita*; the rate of urbanization and the rate of growth of non-agricultural avocations; the actual extent to which un-employment has increased and been reflected in the percentage of non-earning dependency, the actual extent to which under-employment has increased and been reflected in the number of workers on unit area of cultivated land, and finally the nature and extent of change, if any, in the participation of unpaid family helpers in cultivation operations. Much more detailed study and many local enquiries are necessary before this inter-relationship can be unravelled completely.

VII— Among cultivators the relative proportion of those who may be called owner-cultivators because they possess permanent and heritable occupancy rights in land must have increased to some extent between 1931 and 1951. It is not, however, possible to institute a comparison in this respect because of non-comparable classification at the two censuses.

VIII— Agricultural rentiers formed only a small proportion of the people in 1931 and this proportion has become still smaller in 1951.

D — *Growth of Food Shortage*

AN EXTRAORDINARY development has taken place within the last 10 years, which very few people would have regarded as a likely occurrence before 1941. This development is generally referred to as 'food controls'. That is a poor and somewhat misleading description of the reality—which consists primarily of a gigantic state trading system, set up by the Central Government and all the State Governments functioning in co-operation with one another. What are called 'controls' are the legal restrictions on traders, producers and consumers of foodgrains which enable this state trading system to function.

The operations of this system during the three calendar years 1949, 1950 and 1951 may be summed up in a few simple figures. On an average, 43·0 lakhs of tons were purchased every year in different states within the country—mostly from farmers directly, in some places from traders. Another 34·8 lakhs of tons were purchased every year from various foreign countries of the world. These enormous quantities of food were moved over great distances, stored and distributed. The purchases and distributions were carried out in accordance with an overall basic plan framed once every year for the country as a whole by the Central Government, and, within the framework of this plan, of detailed plans for each state, framed by the State Government concerned. These plans were not designed to make commercial profits. They were designed primarily to meet the daily needs of crores of people all the year round, to safeguard several other crores of people against the serious consequences of excessive rise of prices or interruptions of supply in private trade. So long as aggregate supplies are smaller than the quantities needed, the plans were designed to spread the national shortage over as large a number as possible and insure them against the risk of death by starvation. The average annual issues thus made from stocks of government grain to ration shops, fair price shops, relief quota shops and various other controlled distribution agencies amounted to 77·1 lakhs of tons.

According to reports (which relate to a short period immediately before 31st March, 1951), the total number of people who received supplies issued from Government stocks numbered 12 crores and 66 lakhs. Not all of them were supplied continuously all the year round. At least one third of this total must have been so supplied—possibly more. The others were supplied with grain during those months of the year when they were most in need and when private trade could be least relied upon to provide regular supplies at fair prices. TABLE 17 on next page shows the number of consumers of supplies made available by this nation-wide 'state trading system'.

TABLE 17

	(IN LAKHS)	
	Rural population	Urban population
Statutory rationing	84	384
Non-statutory rationing	134	37
Relief quota shops and fair price shops	487	5
Other agencies of controlled distribution	117	18
TOTAL	822	444

We should realise that this system literally forced itself on the country. The Government never wanted to carry the responsibility. They have made more than one effort to rid themselves of it, but without success. Why did this happen? We should try to understand the development in the perspective of history.

48 The establishment and development of a free market throughout India and its linkage with the world market was perhaps the most important among the economic changes brought about under British rule sometime in the middle of the last century. The reform was visibly beneficial, in that it gave a great fillip to the development of cultivation. A brisk foreign trade grew up. Notwithstanding this general prosperity, parts of the country were ravaged by famine and some classes of the people—especially those who were losing their livelihood in the new free market—suffered grievously. Therefore, the Government of those days took effective steps energetically in order to combat the famines, to relieve suffering and to save life. What was the right thing to do in order to achieve these purposes, without creating avoidable wastes and abuses, was not easy to settle off-hand—it had to be discovered by trial and error. One of the most contentious and perplexing issues in this process of trial and error had been whether or not steps should be taken by Government to control the price of grain and arrange its distribution. The conclusion finally reached was recorded by the Famine Commission of 1880 in the following terms :

"We have no doubt that the true principle for the Government to adopt as its general rule of conduct in this matter is to leave the business of the supply and distribution of food to private trade, taking care that every possible facility is given for its free action and that all obstacles material or fiscal are, as far as practicable, removed. The manner in which the demand for grain in South India in 1877 was met by supplies sent from the North shows the promptitude with which Indian trade will operate

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when the facilities for transport and the profit expected are adequate . . . It is only reasonable to anticipate that with every year's additional experience of the use to be made of the railways and the telegraphs, the activity and sensitiveness of Indian trade will continue to grow, and that with the new stimulus thus imparted to it, and the gradual extension of railways into districts where they do not yet exist, the power of meeting the wants of the population, in time of local scarcity, will be still further developed. Every interference by the Government with the operations of trade must be adverse to this tendency, and prejudicial to those habits of self-reliance which it is so essential for Government to encourage"

This policy was consistently followed. In the short run, it was not conspicuously successful. Thus it failed during the last decade of the last century when millions died of famine, while export of grain was going on. The failure must be attributed to the fact that the basic assumption underlying the policy—the presence of an overall surplus even in the worst famine years—*was not yet a fact. But it was tending to become a fact.* With every year that passed thereafter, the policy turned out to be so uniformly successful that it got established as an axiom of public administration. For a brief space of a few months (shortly after the end of World War I) the axiom was called in question, prices and movements of rice had to be controlled. But the spasm passed. Every thing was normal again. A generation grew up which took it for granted that interference by Government in any shape or form, with the activities of traders was unthinkable. The vitality of this belief was such that it survived the world economic depression of the thirties. A fantastic fall of grain prices was occurring. All over the country, scores of farmers were reeling under the blow, suffering unjust losses and getting loaded with debts. Bankruptcies were multiplying. It was realised that the country and the world were passing through an extraordinary crisis. It was necessary to do something especially to relieve the farmers. So, arrangements were made to suspend or remit land revenue and rents. Governments went even so far as to scale down debts—at first by conciliation and later by statutory compulsion. *But that anything should be done directly to adjust the market supply of grain to the market demand and fix and hold a fair price—the idea was not even seriously considered*

49 The change came about all of a sudden, shortly after Japan entered World War II and her forces occupied most of the countries of South-East Asia. Burma fell, and the imports of rice from that country were cut-off. The reaction in all the grain markets of India was immediate, violent and prolonged. Supplies disappeared and reappeared in small quantities fitfully. Prices shot up inexplicably. This could not go on for any length of time without putting the lives of masses of people in jeopardy. *Bankruptcy is one thing—death is another. The Governments had, perforce, to interfere.* But they

found soon enough, that a simple order addressed to the trade to the effect that a price specified in the order should not be exceeded, meant nothing at all. It merely meant that law-abiding traders should quit business—leaving the trade entirely in the hands of hardened speculators. The consumer was worse off than before. Experience clearly showed that it was not a question of wickedness of individuals—it was the system which could no longer function. The vast mass of traders—the retailers—were ready and willing to carry out distribution according to the needs of the people within the limits of prices fixed by Governments, but only if they could be assured by Government that they could get regular supplies at corresponding prices. This meant Government going into the wholesale trade in a big way, superseding a relatively small number of the larger wholesale dealers (to whom speculation offered too great a temptation to resist), converting the smaller wholesale dealers into its own agents, and (most important of all) assuring itself of regular supplies from farmers by the exercise of statutory powers. No one had planned in advance that these were the right steps to take. It took time to find out, by a process of trial and error. But it did not take very long in those parts of the country where the Provincial or State Government had a clear perception of the objective to be secured and a firm determination to secure it.

There was some delay and indecision in Bengal, and this coincided with a crop-failure (not, in itself, of a very exceptional character). The result was a tragic repetition of the famines of the last century—15 lakhs of people died of hunger and the diseases attending famine, all within a few months. The tragedy gave a sharp jolt to the minds of the people and made them realise that unless there was enough foodgrains to spare after meeting the needs of everybody, free trade cannot function. It was necessary that controlled behaviour should be imposed by Government on all concerned. It was especially necessary that those producers to whom food was not a problem, should part with their surplus of grain in due time at a fixed price. So long as the people realised this and co-operated with the efforts of Government, the system worked well; and, though crop failures occurred in South India in 1946 (which were much more serious than that which touched off tragedy in 1943), the distribution of supplies was kept going and no lives were lost.

50 After the war ended people waited patiently enough for a couple of years hoping that all these necessary though irksome innovations would disappear and they would once again be free to buy and sell foodgrains as they pleased and when they pleased. This nostalgia for the return of free trade was a fact. It pervaded all parts of the country and all Governments had to reckon with it.

Mingled with this genuine feeling, there was no doubt also the knowledge, among quite considerable number of people that if the restrictions were removed they could make large profits in a short time. One of the unfortunate developments, during and since World War II, has been an acquired taste for getting rich quickly.

A committee appointed by Government went into this question and recommended, by a majority, that the controls should be lifted. A minority warned against the step and argued that the time was not yet ripe. The Government acted on the advice of the majority. Within a few months, the experience of 1942 was repeated; and the minority was proved right. Government quickly retraced their steps, lest the situation might drift towards a repetition of the experience of 1943.

51. It is now very nearly five years since foodgrain controls were lifted and then re-imposed. Every one has been hoping each year that the next year would see the end of these controls, but this has not yet happened. People have also been hoping that the need for importing foodgrains would also disappear and that this would release resources for importing machinery needed for industrialising the country. But this has also failed to happen. On the other hand, Government found themselves compelled to import unprecedentedly large quantities of food-grains instead. The relatively easier conditions created by these imports, coinciding with good season for crops is once again having their effect. The mind of the people has been drifting towards de-control and stoppage of imports—in very much the same way as in the closing months of 1947. But the Planning Commission has given warning that controls will have to be kept on and imports will have to be secured; and though the Commission hopes that the implementation of the Plan will lead to an end of both in a short time, it is not prepared to bind itself to a date and it advises caution and preparedness to continue with controls and imports as long as necessary.

52. There is, today, a widespread sense of perplexity—a feeling that the present situation is unintelligible; and, in consequence, a big question mark over the future. There are many questions to which firm answers appear to be unavailable. How much food do we need? How much more food do we need as the population is added to each year? How much food are we producing? No doubt this changes from one year to another because of the seasons, but what (on an average of good, bad and indifferent seasons) are we in fact producing? Is this really less than what we need? If so, how much less? Is it really impossible to do with that much less? Must we import? If so, how much? At what rate has this average production of food been increasing

in the past ? At what rate can we expect it normally to increase in the future ? To what extent can the various development schemes which are included in the First Five Year plan raise the level of average production ? Can we or can we not manage without imports ? If we can, when ? Until then, how much should we import ? Can we afford to pay for these imports ? All these are relevant questions. Most people (probably all whose interest in public affairs is sufficient to induce them to read newspapers regularly) have no doubt put these questions to themselves. It is doubtful whether any one is quite sure in his mind that he has got the right answer to even half the number of questions. The fact is—and we must face it—there are no demonstrably certain answers to these questions. It is true that all the questions raise matters of apparently simple fact, which can be cleared up if statistics are available. But the statistical system of the country has not been designed to answer these questions with certainty. It has not been so designed—because these questions did not require to be answered until about the time when Japan entered World War II.

And yet there is great need for answers which (even if not certain) would carry conviction as probably correct. Experience shows that the people are not unready to accept reasonable restraints designed for the common good or to make present sacrifices in order to secure the welfare of the next generation. But they will not do this if they lack conviction of necessity. This conviction is seldom acquired by ratiocination. It is gained by the mass of the people largely by guidance from the leaders of public opinion. And the leaders cannot succeed in imparting conviction unless they possess it themselves.

It is the purpose of this section and the rest of this report to make such a contribution to the clarification of these important questions as a careful study of available data may render possible.

53. We can be fairly definite about the time when *undivided India** changed over from being a net exporter of foodgrains into a net importer of foodgrains. As it happens, this too was round about 1921. We shall proceed to review the evidence on this point—before and since 1921.

There is a remarkable passage in the report of the Famine Commission of 1880 which refers to certain figures as indicating that “the ordinary outturn of food in British India exceeds 50 million tons, and the ordinary surplus available for storage, for export, or for the luxurious consumption of the richer classes is more than 5 million tons”. The Commission proceeds then to discuss the

*The old statistics of India related to India within present limits, plus Pakistan plus Burma. Separation of the figures relating to these areas presents a difficult problem. Burma figures have been separated. The reference to ‘*undivided India*’ means India plus Pakistan.

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probable shortage likely to be caused in the production of the largest area which — on the basis of previous experience— might be expected to be affected by famine, and whether or not there would be sufficient stocks available within the country to meet the shortage thus caused. 'The probable shortage of the area affected by the worst famine, deemed to be likely, was assumed as 3 million tons. Three sources of supply were designated as available to meet the shortage. "*First*, the local stocks of the distressed area which taken at three months' supply of the people's food amounts to $2\frac{3}{4}$ millions ; *second*, the year's surplus of the districts not affected which would be $3\frac{1}{2}$ millions but might be expected to be larger in consequence of the diminished consumption; and *third*, the local stocks in these districts." The Commission found no difficulty in reaching the conclusion that "these three sources of supply, taken together, would appear to be quite sufficient to provide what was required".

Two members of the Commission dissented from this conclusion. They said "We are unable to place confidence on the table which shows an estimated annual surplus yield of five million tons of foodgrains. The average annual export of rice and grain from all India is one million tons, which should thus leave four million tons to be laid by, a quantity sufficient to feed 24 millions of people. As famines come but once in 12 years, there should in that period be an accumulated surplus sufficient to feed nearly 300 millions. And yet when famine does come, and then affecting at its worst not more than a tenth of that number, it is only by immense pressure on other parts of India, and at a quadrupled price, that the barest sufficiency of supplies can be obtained. This seems a clear proof that the alleged surplus must be greatly overestimated."

This echo from the past is not very unlike a good deal of statistical controversy to which the public has become accustomed during the last ten years. The point to be noted in these exchanges is not as to who was right (the minority, as usual, seems to have been right); but what emerges as undisputed common ground. Both sides agree that India was then normally surplus in foodgrains. The dispute was about whether or not, in the worst famine year, the stocks available would physically exceed the requirements of consumption. At any rate, we know that India was then normally surplus in foodgrains.

54. Elsewhere in the report we have details about the size of this surplus. The Commission explains how and why the value of India's exports was substantially in excess of imports. "For the last ten years, the excess of exports has averaged about 16 million sterling of which perhaps half may be regarded as the return on capital invested in railways and commercial enterprises and half as the charge on account of the administration of India by England which has to be met in England."

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The principal exports are almost entirely the raw produce of agriculture and animal husbandry. They include foodgrains valued at 9 million sterling (or almost exactly the return on capital invested in railways and commercial enterprises). The quantity "touched its highest point in 1876-7, when it reached 26,210,000 cwt, and had fallen to 22,887,000 cwt, in 1878-9". The figures indicate an average of about 12 lakhs of tons per annum as the level of foodgrain exports at the time. The two chief items were rice and wheat and the destinations were Europe, Mauritius, the Cape, other colonies, Arabia and Persia. Thus, we start with the firm knowledge that in or about 1880, India was normally surplus in foodgrains, including both rice and wheat, and the surplus was of the order of 12 lakhs of tons per annum.

55. Then we have good evidence of what was happening during the last decade of the nineteenth century and the first decade of the present century. The relevant statistics were assembled and sifted and the figures relating to Burma separated by a Special Officer (Shri K. L. DATTA) appointed by the Government of India in 1910. The figures for undivided India, averaged for five-year periods, are as follows :

TABLE 18

Five-year period	(IN LAKHS OF TONS)		
	Exports	Imports	Net Exports
1890-91 to 1894-95	14.5	2.1	12.4
1895-96 to 1899-1900	11.0	4.8	6.2
1900-01 to 1904-05	16.6	6.2	10.4
1905-06 to 1909-10	14.8	9.6	5.2

The first half of the famine decade shows the level of net exports to be much the same or as a little above the level reached some 15 years earlier, and described by the Famine Commission of 1880. The second half shows a sharp drop doubtless reflecting the crop failures which led to famine. [But it is significant that exports were taking place even then—though millions were dying in many parts of the country for want of food. We noted this already in our review of policy in relation to freedom of trade.] Then there is a recovery during the first five years of this century followed by a drop. The decade as a whole shows a small decline of about 3 lakhs in ten years—which may not be specially.

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significant. But the trend shown in the table below was undoubtedly quite significant :

TABLE 19

Five-year period	(IN LAKES OF TONS)		
	Net exports out of undivided India and Burma	Net exports out of undivided India	Net exports out of Burma
1890-91 to 1894-95	25.5	12.4	13.0
1895-96 to 1899-1900	21.4	6.2	15.2
1900-01 to 1904-05	31.6	10.4	21.2
1905-06 to 1909-10	28.4	5.2	23.2

There is no mistaking the rising tempo of exports of foodgrains from Burma. British rule was established in Burma later than in India. Suppression of civil disorder, settlement of title to land on durable and secure tenures, development of transportation, creation of a free market and its linkage with a free world market—these were the measures which had already started the development of agricultural production and the canalisation of the resultant surplus into the growing world market. What had already occurred in *undivided* India was now occurring in Burma after a time lag of a few decades. In *undivided* India, the effects of development were beginning to wear-off; and one may, in retrospect, already note signs of the steep diminution of exports of foodgrains which was to follow. In Burma, on the other hand, there was still very considerable scope for profitable development of agricultural production, net exports of foodgrains were, therefore, still rising. The policy of non-interference with private trade in grain (even if famine raged in parts of the country)—the doctrine of the Famine Commission of 1880—worked successfully for nearly forty years, because India, Pakistan and Burma formed a single trading unit and this combined unit had a large and growing exportable surplus of grain. A physical shortage of supply over the entire territory of India, Pakistan and Burma was out of the question; and the development of modern transportation by rail and steamship assured the availability of commercial supplies in all parts of this territory at all times as required.

56 From about the period of World War I, separate statistics for India have been worked out by the Directorate of Economics and Statistics of the

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Ministry of Food and Agriculture They tell us what happened during a succession of five five-year periods ending with the outbreak of World War II. During the first of these periods *i.e.*, 1915-16 to 1919-20, *undivided* India was still functioning as a net exporter. Exports were 15.9 lakhs tons and imports were 11.9 lakhs of tons. Net exports were 4.0 lakhs of tons which is smaller than the last figure we saw for the period 1905-06 to 1909-10. It is significant that in spite of all the inducements and pressures which must have stimulated exports during war-time, the figure was smaller than 10 years earlier. This helps us to understand why it turned out to be the last five-year period when *undivided* India was a net exporter of foodgrains. Thereafter, there was a net import during every five-year period as shown by the table below :

TABLE 20

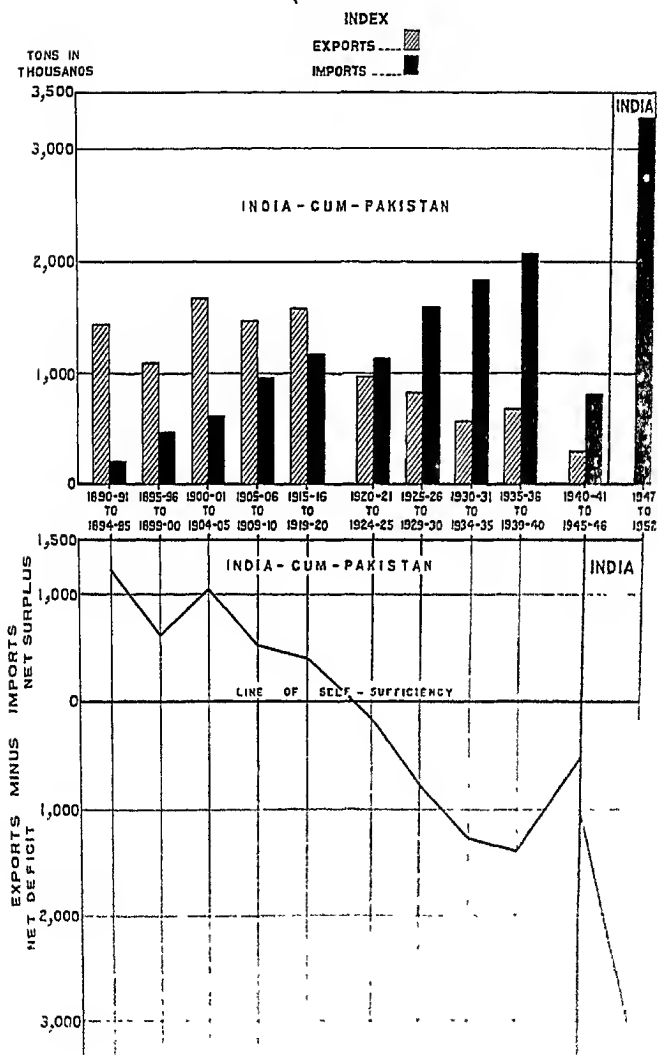
(IN LAKHS OF TONS)						
Five-year period	Imports	Exports	Net Imports			
1920-21 to 1924-25	11.4	9.8	1.6			
1925-26 to 1929-30	15.9	8.3	7.6			
1930-31 to 1934-35	18.4	5.7	12.7			
1935-36 to 1939-40	20.7	6.9	13.8			

There can be no mistake about the meaning of these figures*. They show a consistent trend of increase in average annual imports of foodgrains (mainly rice) and an almost equally consistent decrease in the export of foodgrains (mainly wheat). Net exports had ended. Net imports were increasing rapidly in *undivided* India. At the same time, however, the development of Burmese agriculture was still proceeding. The average level of net exports out of Burma had risen from 23.2 lakhs of tons per annum during 1905-06 to 1909-10 to 30.6 lakhs of tons per annum during the quinquennium preceding World War II.

57. The subsequent changes during and since World War II may be briefly told. During 1940-41 and 1941-42 net imports diminished to 9.6 lakhs and 4.3 lakhs. During 1942-43 imports were cut off and India supplied Ceylon and a few other places; net exports reappeared for about one year though the quantity was small—only 2.9 lakhs. The Bengal Famine occurred during 1943-44.

* The figures relate to India and Pakistan jointly. We are not perhaps likely to be far wrong if we identified the 'imports' and 'exports' figures for the quinquennium 1935-36 to 1939-40 as the net import requirement and net export capacity of India and Pakistan respectively, on the eve of World War II.

EXPORTS AND IMPORTS OF FOODGRAINS IN INDIA (1890-91 TO 1952)



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when India received, under international allocations, a net supply of 3·0 lakhs. The next two years were managed with only 7·3 and 9·3 lakhs of tons. The shortage was made good mainly by eating into the carry-over; the stocks normally carried by farmers, traders and consumers were reduced, thus adding greatly to the difficulties of distribution and creating the risks of break-down which was the nightmare of 1946. The first full post-war year (1946-47) saw India importing 25·8 lakhs and the next year (1947-48), 26·6 lakhs. At that stage, the agitation against state trading commenced. These imports seemed to be both enormous and unnecessary; hence the demand for stoppage of imports and lifting of controls. This did not, however, work. During 1948-49, the first full year after partition, India imported 30·5 lakhs. Then it was reduced to 28·6 and 27·2 lakhs. This was followed by two successive years of very large imports. The Report of the Planning Commission mentions 32·7 lakhs as the average level of imports during 1947-52.

58. 32·7 lakhs of tons may seem, at first sight, to be a large figure for importation every year. But it would not surprise anyone who was familiar with the trend of changes in population and cultivation as well as of imports and exports of foodgrains and who had appreciated the significance of the figures in TABLE 20. Indeed, as we shall see later, the real occasion for surprise and perplexity is that the level of average imports rose so slowly and is still so low, when compared with the rapidity of decline of cultivation *per capita*.

One other comment which should be made at this stage is the fact that the composition of the imports had changed greatly; there was very little rice and a great deal of wheat and coarse grains. Before World War II, it will be recalled, India was importing rice heavily, but still exporting wheat. The change of composition became necessary because the grain was procured mostly from new sources of supply. It is necessary to note what happened to Burma whose steadily increasing exports of rice were the main source of supply of steadily increasing imports into India. During the war, of course, Burma exported no rice to India. After the war ended, a trickle of exports re-started. On an average of three years 1948-50 it has risen only to 12·1 lakhs, which was lower than the level reached over sixty years ago; and less than two-fifths of the level reached just before World War II. As it is obvious that the population of Burma could not have grown during these 10 or 12 years to the point at which its export surplus could be so largely eaten up, it is evident that cultivation must have diminished, or the marketing of the surplus is being held up or both must have happened. The disturbed conditions which have, no doubt, contributed to these results may be overcome at a not too distant date. But would

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exports from Burma ever again reach the pre-war level ? Or may it be that it would reach only a lower level and then Burma would repeat the history of India with a declining level of exports ?

59. Did the rapid growth of net imports after 1921 owe its origin to the decline of cultivation *per capita*, or could it be that it was due to a shift of cultivation away from foodgrains to other crops. There was indeed a decline in the percentage of area sown to foodgrains to the total sown area under all crops. The figures for the districts whose statistics were specially compiled and set out in the last section were 80.7 per cent in 1891, 77.8 per cent in 1921 and 77.2 per cent in 1951. The difference between 1921 and 1951 is hardly significant. *The main increases in imports, which took place during the last three decades, cannot therefore be attributed to the shift in cultivation away from foodgrains. This is an important fact.*

While this is true of India as a whole, the shift is somewhat more clearly marked in particular areas. This is seen from the table below :

TABLE 21

Natural division	Percentage of area under food-crops to total area sown		
	1891	1921	1951
Bombay Deccan Northern (part)	81.1	74.3	73.4
Bombay Deccan Southern	77.3	68.7	67.4
Bombay-Konkan (part)	92.6	75.9	72.5
Mysore	85.4	82.5	76.4
North-West Madhya Pradesh	80.2	77.8	81.7
South-West Madhya Pradesh	57.7	53.7	58.4
Madras Deccan	76.8	74.6	66.4
West Madras	71.4	64.8	59.6
South Madras (part)	84.6	78.2	74.7
East U.P. Plain	88.2	91.8	90.3
Central U.P. Plain	90.4	91.6	90.2
West U.P. Plain (part)	82.3	81.3	81.4
U.P. Hills & Plateau (part)	80.4	86.1	92.1

These figures show (i) that the shifts away from foodgrains to other crops (presumably oilseeds and cotton) were more significant before 1921 than later; (ii) they were more significant in South India and West India than elsewhere; and (iii) that shifts in the opposite direction also occurred, these being significant in North India and Central India.

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60. The period of several years during which India was forced to manage without adequate imports of grains witnessed an increase of grain prices of an altogether unprecedented character. When it took place, there was no question of its being dictated by economic necessity. There was a shortage of foodgrains; and people must eat or starve to death. Under conditions of free trade, those who held grain could, by the simple process of declining to sell it for a time, raise the price to almost any height. And they did so, repeatedly. The first wave of increase took place in this manner until the Governments stepped in, and by their intervention froze the prices at whatever levels had been reached in different parts of the country on various dates in the second half-year of 1942 and the first half-year of 1943. In Bengal, the freezing came later. As a result not of price control orders but of the operation of the state trading system, the price of foodgrains was held for sometime at a stable level. But the consequences of the original rise were working themselves out. The prices of other foodstuffs and agricultural produce went up because the price of grain had gone up. The cost of food having gone up, wages had to be raised or supplemented by dearness allowances. The price of other commodities went up because wages and dearness allowances increased the cost of production. When the wheel had thus come full circle, the farmers complained that other prices had risen against them while the price of grain was held down by Government control. They also complained about the arbitrary differences between grain prices allowed to farmers in different parts of the country which had only a historical (and no economic) justification. Complaints of this nature helped to swell the general chorus of discontent which led to de-control early in 1948. A second wave of rise in prices followed. *Re-control froze the grain prices at the higher levels reached by the second wave.* The repercussions of these higher prices of grains were reinforced by the effects of the Korean War. The struggle of the Governments against the persistent tendency of prices to rise still continues. The tap-root of this continued pressure still remains—the fundamental disparity between the demand for and supply of foodgrains, and the fact that the consumer cannot stand out against a rise in grain prices in the same way in which he can stand out against a rise in prices of almost any other commodity or service. History provides no more vivid demonstration of the crucial role of grain prices in the life of the people.

61. It so happens that the longest continuous record of carefully ascertained prices is available with the Madras Government. From this record a chart has been prepared which shows the trend of South Indian paddy prices over a period

CHAPTER IV : BEFORE AND SINCE 1921

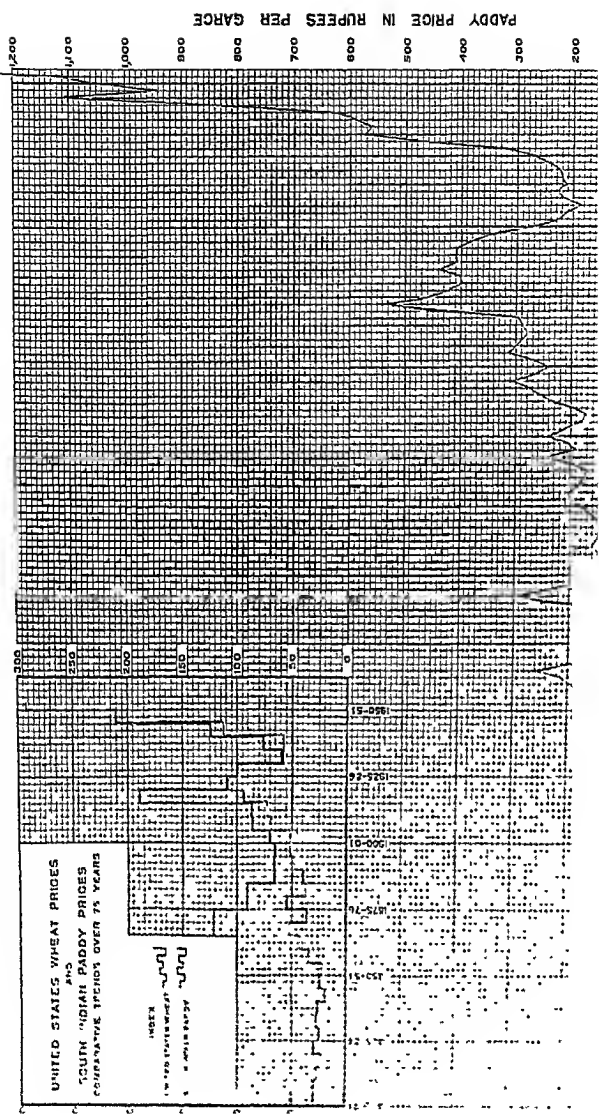
of 150 years. The chart will repay careful study. For the first fifty years one can see a level course ; the price bobs up and down, but the fluctuations are relatively small. Then for another fifty years one can see that the line— above and below which fluctuations take place— is no longer level. Each decade is a little higher than the preceding one. At the same time, the fluctuations tend to be sharper. We get peaks arising suddenly ; they are the famine years. This part of the diagram shows the trend of India's free market, firmly linked to a growing world market. And then the last fifty years—with the first big peak marking out World War I, then a valley marking the world economic depression and, finally, the tallest of all peaks on which we stand today.

62. On the top left-hand corner, in the same chart, there is an inset diagram which is also well worth study. It shows the comparison between the course of wheat prices in the United States of America (marked by a black line) and South Indian paddy prices (marked by a red line)— both being reduced to a common index with the years 1925-26 to 1929-30 as the base period. It is a convenient base— for, it marks the level from which grain prices plunged downwards and caused great hardship among farmers. Until a few years before World War I, wheat prices in the United States had been moving downwards— over a long period. During the same period, the South Indian paddy price was moving upwards. The American peak during World War I was very much taller than the Indian peak. Then the two prices moved in step, and followed a remarkably similar course — sometimes one leading and sometimes the other— throughout the period between the two world wars, and since the end of World War II up to 1948. Whereas, however, the American price has stayed behind at a level which is just under 200 per cent of the base period level, ours has moved up to 292 per cent.*

63. In our attempt to establish the real existence, to assess the size, and to determine the rate of growth of our shortage of foodgrains, we have relied so far only on figures of imports and exports. We have brought in the figures about foodgrain prices, as corroborative evidence of a telling nature, and to indicate how the entire economy in all its parts is detrimentally affected by the present condition of supplies and prices of foodgrains. We now proceed to a much

*It should perhaps be made clear here that the chart shows the South Indian paddy prices— not because they are peculiar— but because they are the only prices which happen to be available over such a long period and they are known to be fully reliable. Their relationship with the U S prices during the period when there was an effectively free world market in foodgrains shows that over this period long-term trend must have been the same in respect of the grain prices generally in all parts of India. Statistical data showing the course of prices after free trade ended have been assembled for different grains and different parts of the country. They will be found among the papers printed as APPENDIX V. They do not modify, in any material particulars, the general picture conveyed by this chart relating to South India.

SOUTH INDIAN PADDY PRICES-TREND OVER 150 YEARS



GROWTH OF FOOD SHORTAGE

more hazardous undertaking—the direct determination of the shortage as the difference between production and consumption. Why is this undertaking hazardous? About seventy years ago, as we saw, the Famine Commission attempted this task and reached the conclusion that there was a surplus of about 42 lakhs of tons per annum in the territory now divided into India and Pakistan, and there was in addition a surplus of about 8 lakhs in Burma. Two members of the Commission rejected the figures as well as the conclusion and gave quite convincing reasons for doing so. Seven decades have passed since then. Our state of knowledge is not much better today. A little less than ten years ago, the Commission which enquired into the Bengal Famine attempted a similar task, limited however to the territory and population of *undivided* Bengal. A relevant extract from the analysis made by the Commission (part of which is useful for our enquiry) will be found in APPENDIX V. The conclusion reached by the Commission (which indicates the hazard clearly) runs as follows :

"It may thus be concluded that the information available is such that an estimate of the annual consumption of the province based on population statistics and an assumed average rate of individual consumption is likely to err by as much as 2 million tons— or about 25 per cent of the estimate. So wide a margin of error blocks this method of approach."

A few weeks ago, the Department of Economic Affairs of the Government of India issued a report on the results of the "First Round" enquiry of the National Sample Survey. An attempt had been made to ascertain both production and consumption in rural areas by enquiries made from heads of households selected on a random sample basis. The enquiry yielded the following results :

The average rural household produced 19.9 maunds of foodgrains every year and ate 26.4 maunds during every year. As this obviously cannot be correct, the report proceeds to distinguish between its consumption estimate and its production estimate and found reasons for rejecting the latter and accepting the former as reliable. But then there was a difficulty. If its consumption estimate was substantially correct then the figures compiled by all the State Governments and the Central Government and annually published as the estimated yield of crops could not also be correct. The report preferred the consumption estimate ascertained by the "First Round" enquiry and recorded the opinion "on the basis of the above conclusions, the magnitude of under-estimation of the official figures of production would seem to lie between 20 and 27 per cent. of the estimated consumption out of domestic production". This particular conclusion may or may not be correct. Even if it is correct it does not prove (as some commentators thought it did) that India's production of foodgrains exceeded its requirements and there was no shortage of foodgrains. What the report does really

prove in relation to India as a whole is what the Famine Enquiry Commission had already stated about *undivided Bengal* *Our knowledge of the absolute magnitude of either production or consumption is subject to a wide margin of uncertainty—so wide that it is larger than the magnitude of our shortage.*

64 That this is the present state of our knowledge is a fact, and we have to face it as a fact. But it does not follow, in consequence, that we shall be wise to hold any opinion we please about food shortage. It does not absolve us from the obligation to form as sound a judgment as possible on all the evidence available to us. A detailed study of this evidence will be found in a note entitled "Production, consumption and shortage of foodgrains (1951)", printed as one of the papers of APPENDIX V. The main conclusions may be set out as below :

I—The average yield (*less seed*) on one acre sown to all foodgrains is 6.0 maunds in the country as a whole. The rate is highest in South India (8.2 maunds) and lowest in West India (3.6 maunds). The rates in other zones, in order, are : East India (7.3), North India (6.6), North-West India (6.2) and Central India (4.5).

II—The average rate of consumption of foodgrains per head of population per annum is 4.5 maunds. The rate is highest in North-West India (5.0 maunds) and lowest in South India (3.8 maunds). The rates in other zones, in order, are : Central India (4.8), North India (4.6), East India (4.6) and West India (4.0). [No separate allowance is made for grain fed to cattle and grain wasted between the field and the kitchen. The rates include such grain also.]

III—India's shortage of foodgrains, round about 1951, was 34 lakhs of tons—being the difference between 590 lakhs of tons of consumption and 556 lakhs of harvested yield (*less seed*). The shortage is equivalent to the foodgrains needed for consumption during 21 days in the year. Among the zones, the shortage is negligible in Central India and relatively small in North India and North-West India.

The shortages in the other three zones expressed in the number of days of consumption requirements are as follows : West India (67 days), South India (34 days) and East India (17 days). It should be clearly borne in mind that these are only the best estimates which can be framed on the basis of official figures of acreage and yield of crops. They may be wrong. The total production may be higher. If so, the total consumption must also be higher correspondingly.

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65. A great many people are puzzled by the fact that the shortage is admittedly a small proportion of total consumption—the food needed for only 21 days in the year. Why should there be so much difficulty about managing without imports and without controls? This question has been posed and conclusively answered in a number of reports—a few relevant extracts will be found in APPENDIX V. It is necessary that the answer should be understood and conviction attained that *free trade cannot function in a market which is genuinely short of foodgrains—however small the shortage.*

66. Another question arises in relation to the relative smallness of the shortage of foodgrains. We have seen that about thirty years ago, *undivided* India was neither a net exporter nor a net importer of foodgrains. At that time production *per capita* and consumption *per capita* were in balance. Since then, there has been a decline of cultivation *per capita* of not less than, say, one-fifth. If our rate of consumption *per capita* had been 4·5 maunds then, as it is assessed to be now, then the shortage today must be of the order of 0·9 maunds—nine-tenths of a maund to a maund *per capita*. But this is assessed at about 34 lakhs of tons per annum in absolute quantity or rather less than 0·3 of a maund *per capita*. The difference is large and it raises an important issue. We can understand why imports have been steadily growing. Once we admit cultivation *per capita* has been declining for 30 years and the percentage of foodgrain cultivation remained substantially the same, the need for imports on an increasing scale is clear and calls for no further explanation. What needs explanation is—why the imports were not so much larger than they actually were. If the figures so far mentioned are correct, the correct level of imports should be about 100 lakhs of tons. Why are they only 34 lakhs of tons? We must face this question—not as a matter of arithmetical curiosity—because of its implications for the future.

What are the possible explanations?

First,—Our assessment of the decline of cultivation *per capita* was based on areas for which we had statistics. Could it be that in the areas for which there were no statistics, cultivation kept pace with population and there was no decline, or a smaller rate of decline. This is not impossible, for these are generally backward areas, where modern transportation and commercialised agriculture might have been late in arriving. But the net effect on the average rate of decline for India could not have been very large.

Secondly,—We took note only of double-cropping and irrigation as the factors which might have raised the yield per acre of cultivated land. What about

other factors ? Could it be that the scale of manuring has increased For a number of reasons this seems very unlikely; the contrary is more probable. Could it be that cultivators put in more effort and got a better yield The 'official estimates' of yield over a long period do not show any such thing; but that is not very conclusive, because they are not refined methods of measurement and might have easily failed to detect a very small but pervasive increase, if it had occurred gradually over a long period. This possibility is not to be dismissed lightly ; because when people have to extract a subsistence out of the same land for larger numbers, they do have a strong incentive to look after cultivation better and more people to do it with. During the thirties especially, cultivators had an extremely bad time. It was precisely when prices were very low, they were obliged to mobilise and sell all the grain they could grow in order to meet their money obligations which were then very heavy. Getting in the extra quantity of grain was much more important then, than it had been during the last decade There may, therefore, have been something in this—though it is very difficult to put a figure on it.

Thirdly,— It seems likely that a progressive reduction of wastage of grain and its use as cattle-feed might have occurred Some old estimates supplied to the Famine Commission of 1880 (which will be found in APPENDIX V) seem extremely generous today. It is common experience that people tend to waste more when they have more to waste.

Fourthly,— It may be that, as population increased under conditions of growing food shortage, the average rate of consumption has also fallen. Is this likely ? It is generally believed, with fairly good reason, that cultivators throughout the country have been eating better during the last decade than during the preceding decade The results of some diet surveys made within the last ten years lend support to this belief During the thirties, the abnormal fall of prices compelled sales of grain which might have forced cultivators on the margin to stint themselves This pressure has been wholly removed and along with it, no doubt, the stinting Except in areas which are liable to drought, cultivating labourers are in a stronger bargaining position *vis-à-vis* cultivators than they used to be; and it is likely that they are less underfed than they used to be

In areas where prohibition has worked successfully, it is likely that there has been an increase of purchasing capacity and better consumption of grain All these are indications to the contrary At the same time there has been a very large growth of urban population The average level of grain consumption in towns is lower than in villages It is possible that the migrants from villages to towns are more largely drawn from the poorest classes of villagers, and they may

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have relatively lower rates of grain consumption. On a balance of all considerations, it seems likely that *when population grows in number in conditions of growing food shortage the average level of food consumption does tend to fall*; that this tendency was probably fully operative during the thirties and that it probably continued to be operative during the forties also, though not perhaps to the same extent as during the thirties.

CHAPTER V

The Prospect—1981

A — Future Growth of Population

OF ALL COUNTRIES in the world, Great Britain has perhaps the largest assemblage of the most reliable population data, extending in a systematic time-series over the longest period in the past. Yet when the Royal Commission on population set out to "examine the facts relating to the present population trends in Great Britain ; to investigate the causes of these trends and to consider their probable consequences ; to consider what measures, if any, should be taken in the national interest to influence the future trend of population and to make recommendations", it found the data insufficient in material particulars. So, arrangements were made for special enquiries to be conducted in order to provide the additional information required by the Commission.

After a thorough analysis and prolonged study of abundant material, the Commission achieved a forecast of the future growth of population. Before setting out and discussing the forecast, the Commission made the following preliminary observations :

"In this and the following chapter we shall try to follow the trend of population some way into the future. Our first and main concern will be to explore the prospects of natural increase. Making the assumption that there is no net migration, we shall seek to find out how the population might develop under the influence of fertility and mortality alone.

"We shall have to begin by looking at the existing population, which naturally conditions future possibilities. We shall be led thereby into a consideration of the number of probable survivors at various future dates of the population now living, and for this purpose it will be necessary to make some assumptions about future deaths. We shall have, therefore, to consider in the light of past history and present knowledge what seems likely to be the trend of mortality rates in future. To complete the picture it will be necessary to have figures for the numbers in the age groups not yet born, and this involves forecasting future fertility rates. The analysis we have made of the past suggests that this will have to be taken in two stages—(1) forecasting the number of married couples and (2) forecasting marital fertility rates. We must emphasise that we do not use the word 'forecast' here in the sense of confident prediction ; the procedure will rather be to work out the consequences of various alternatives within the

CHAPTER V : THE PROSPECT—1981

bounds of reasonable probability. It is when we come to the forecasting of births that these bounds are widest and the prediction of the numbers of any group containing persons as yet unborn is, therefore, particularly difficult."

2. The passage has been reproduced because it explains clearly what is involved in the attempt to peer into the future in order to form an opinion about future numbers, the nature of the data required for the attempt and the strictly conditional nature of the results to be expected. We shall presently see the application of these observations to ourselves. It is, however, not irrelevant for purposes of this report to set out at this stage the forecast made by the Commission of the future of the British population.

3. The total population of Great Britain had been 105 lakhs in 1801. This had grown, at an enormously rapid rate, to 370 lakhs in 1901. The 1951 Census showed the number had grown further (though more slowly) to 488 lakhs. The Commission (making its calculations in 1947) looked into the future for a century ahead. It made three different assumptions which led to three different conclusions as below.

TABLE I

Year	(IN LAKHS)		
	First assumption	Second assumption	Third assumption
1962	502	499	508
1977	507	486	518
2007	489	415	523
2047	455	296	527

All the three assumptions relate to the future of the 'family size' (by which term, the Commission refers to the average of the total number of children born to every married woman, on completion of her child-bearing period). If the present level (indicated by the actual experience of women who married during the years 1927 to 1938) remained unaltered in future, the rate of growth of population will slow down and stop sometime towards the end of this century and a reduction of numbers will begin. But the reduction will be small—there would be 455 lakhs in 2047. But if the tendency to reduction of the 'family size' continues further and stability is attained only at four-fifths of the present level, then the reduction of numbers will start much earlier and occur more rapidly. There would be only 296 lakhs in 2047. If, however, the present level is slightly increased—by 6 per cent only—and stability is attained at this

slightly higher level, a slow rate of growth may be kept up for a very long time and the possibility of absolute decline in numbers postponed for at least a century. Accepting these conclusions as data, the Commission then proceeded to discuss the social, economic and other implications of these different possibilities for the future.

4 From what has been said earlier in this report, it will be observed that we do not possess population data which can be compared even remotely with those available to the Royal Commission. Our attempt to peer into the future must, therefore, be limited to a relatively short time, and our conclusions must be based on methods of deduction of a much less rigorous nature. To make two simple alternative assumptions first, let us suppose that during each of the

TABLE 2

Year			Lower limit	Upper limit
1951	.	.	3,613	3,613
1961	.	.	4,077	4,119
1971	.	.	4,585	4,697
1981	.	.	5,276	5,355

three decades 1951-60, 1961-70 and 1971-80 the mean decennial rate of growth of population will be—(a) the same as that of the average of the three decades 1921-50; or (b) the same as that of the latest of the same three decades (when the growth rate was highest). These two assumptions may be regarded as yielding

the lower and upper limits (TABLE 2) of the probable future figures.

5 The foregoing table shows the results of a very simple calculation. Another line of approach—which involves somewhat more complicated calculations—yields the figures of TABLE 3 on next page. They represent a forecast for the years 1961, 1971 and 1981 of the population of three states (Uttar Pradesh, Madras and Madhya Pradesh) showing the total number, its division into three broad age-groups (*viz.*, under 15, 15 to 54 and 55 and over), and their subdivision by sexes. The forecast is based on the following assumptions:

First,—Apart from the disappearance of child marriages, there will be no material change in marital or conjugal habits, married women of the same number and the same age will be giving birth to approximately the same number of children during each of the thirty years 1951-1980 as on an average of the thirty years 1921-50.

Secondly,—The mortality rates in every age-group will be approximately the same during each of the next thirty years 1951-1980 as on an average of the thirty years 1921-50.

CHAPTER V : THE PROSPECT—1981

TABLE 3

Year 1	Population (IN THOUSANDS)									
	All ages			0-14		15-64		55 and over		
	P	M	F	M	F	M	F	M	F	
	2	3	4	5	6	7	8	9	10	
Uttar Pradesh										
1921	46,669	24,451	22,218	9,233	8,237	13,531	12,287	1,687	1,694	
1931	49,777	26,147	23,630	10,181	9,189	14,371	12,870	1,595	1,571	
1941	56,532	29,639	26,893	11,292	10,225	16,211	14,635	2,136	2,033	
1951	63,216	33,098	30,118	12,648	11,696	17,715	15,836	2,735	2,586	
1961	70,017	36,641	33,369	14,316	12,851	19,275	17,683	3,050	2,835	
1971	78,036	40,677	37,359	15,953	14,671	21,473	19,733	3,251	2,955	
1981	87,437	45,644	41,793	18,124	16,303	24,132	22,439	3,388	3,051	
Madras										
1921	40,593	20,060	20,533	7,672	7,648	10,763	11,252	1,625	1,633	
1931	44,650	21,091	22,559	8,744	8,641	11,771	12,302	1,576	1,616	
1941	49,831	24,796	25,035	9,773	9,633	13,233	13,575	1,790	1,827	
1951	57,016	28,419	28,597	10,334	10,291	15,599	15,804	2,486	2,502	
1961	64,231	32,028	32,203	12,234	12,122	16,915	17,172	2,879	2,909	
1971	70,173	35,023	35,150	13,055	12,937	18,831	19,033	3,137	3,180	
1981	79,429	39,648	39,781	15,279	15,086	20,986	21,306	3,383	3,389	
Madhya Pradesh										
1921	15,797	7,891	7,906	3,285	3,194	4,670	4,085	536	627	
1931	17,794	8,899	8,893	3,596	3,543	4,759	4,721	544	629	
1941	19,632	9,837	9,795	3,813	3,711	5,325	5,271	699	813	
1951	21,248	10,663	10,585	4,137	4,014	5,758	5,627	768	944	
1961	23,453	11,745	11,708	4,585	4,469	6,293	6,172	867	1,067	
1971	25,811	12,934	12,877	5,011	4,907	6,958	6,768	965	1,202	
1981	28,636	14,340	14,296	5,632	5,492	7,693	7,512	1,015	1,293	

NOTE—All persons who were aged 10 and over at the Census of 1931 were all alive in 1921 and must have been counted at the 1921 Census. It is possible to identify the corresponding numbers, age-group by age-group. Thus we may compare the number aged 15 to 24 in 1921 with the number aged 25 to 34 in 1931 and express the latter as a proportion of the former. This can be done for three successive ten-year periods (1921-30, 1931-40 and 1941-50) and an average struck. In this manner an average (which may be called the 'surviving population rate') can be struck for every age-group into which all persons aged 10 and over are divided and for the two sexes separately. This is the first step.

All persons who were under age 10 at the Census of 1931 must have been born after the 1921 Census. They may be divided into four groups—under age 5 and between ages 5 to 9, separately for males and females. These are the four 'new population' groups at each census. It is assumed that their numbers are correlated directly to the mean of the numbers of women aged 15 to 44 at two successive censuses. The multiplying factors which when applied to the latter will yield the former, are then worked out for each of the three decades. Their average is then struck for the three decades—they may be called the 'new population rates'. This completes the second step.

We then proceed to the third step which consists of three stages. First the surviving population rates are applied to the 1951 Census figures and we get the age-groups by sexes for 1961 of all persons aged 10 and over. The application of the new population rates then completes the 1961 figures by yielding the numbers of males under age 5, males aged 5 to 9, females under age 5 and females aged 5 to 9. The process is repeated with reference to the 1961 figures thus obtained, and the 1971 figures are secured. By a repetition of the same process in relation to the 1971 figures, 1981 figures are obtained.

FUTURE GROWTH OF POPULATION

We shall consider presently whether these assumptions are reasonable and likely to hold good. But assuming they do, the results for the three states may be fairly expected to be as indicated in TABLE 3. We may (by a further deduction) arrive at a minimal estimate of the future growth of population for the country as a whole up to 1981 as shown in the table below :

TABLE 4

Growth of population (Past actuals since 1891)			Growth of population (Minimal estimates upto 1981)		
Year	Population (IN LAKHS)	Increase during preceding 10 years	Year	Population (IN LAKHS)	Increase during preceding 10 years
1891	2,384	..	1951	3,613	445
1901	2,384	0	1961	4,078	465
1911	2,522	138	1971	4,527	449
1921	2,514	Decrease	1981	5,157	630
1931	2,791	277			
1941	3,168	377			
1951	3,613	445			

NOTE.— The figures include the state of Jammu and Kashmir and allow for 'inflation' in the 1941 Census by an estimated 20 lakhs

The calculations which yielded the forecasts furnished in TABLE 3 for the three states are explained in the note below the table. Calculations of the same nature were not attempted for the country as a whole because of difficulties in reconstructing age/sex details with reference to territorial changes. The forecast for India was deduced from the forecast for the three states*— Uttar Pradesh, Madras and Madhya Pradesh. These three states— which had added

* It is possible to compute forecasts for Bombay, in the same manner as for the three states mentioned above. But it was not considered safe to apply the same calculations to that state in view of the large part played by migration in the growth of population of that state. If it is justifiable to assume that migration would continue on the same scale up to 1981 (this is not very likely) the forecast for Bombay would be a steady growth from 360 lakhs in 1951 to 427 lakhs in 1961, 507 lakhs in 1971 and 607 lakhs in 1981. When these figures were added to those of other three states and alternative forecasts for India were deduced by comparison with the total of all the four states inclusive of Bombay, the results were as follows: 4,072 lakhs in 1961, 4,585 lakhs in 1971 and 5,276 lakhs in 1981. These figures (which are not so very different from the minimal estimates furnished in TABLE 4 above) give an indication of the order of magnitude of the uncertainty involved in our necessarily rough calculations.

to their population during 1921-50, 384 lakhs— will add 540 lakhs during 1951-80. India had added to its population during 1921-50, 1,099 lakhs. Assuming that its growth during 1951-80 will bear the same proportion to its growth during 1921-50 as the three states combined, the addition during 1951-80 should be 1,544 lakhs. The figures for growth up to 1971 and 1961 are also arrived at by like reasoning.

6 Both types of calculations are of a rough and ready nature. One type of calculation makes some sort of allowance for differences in rates of growth likely to be caused by changes in the age-sex pattern; the other type does not

The important thing to note is not the exact figures—for it is no use attempting to forecast in units smaller than a crore. What should be noted is the fact that, *if we start with the assumption that the future growth will be limited by the experience of 1921-50, we get by different methods numbers of much the same order— 41 crores in 1961, 46 crores in 1971 and 52 crores in 1981*. We should also note from TABLE 2 that the figures we are likely to get by assuming that future growth will reproduce the experience of 1941-50 throughout the next thirty years would be higher, but not very much higher. *Are we right in assuming that maternity rates and mortality rates will be the same during the next thirty years, as during the last thirty years?* Do we have any indications from past experience which would help us to answer this question? Let us review the past briefly from this point of view. In doing so, we should make a distinction between two quite different sets of questions. We have already seen that the period of thirty years before 1921 differed sharply from the thirty-year period since 1921. The difference, as we have seen, consists in the virtual elimination (barring one exception) of deaths from famine and pestilence, and the commencement of a process of significant reduction in what may be called normal mortality. May we assume that these gains are permanent? Or should we accept as a possibility that famine and pestilence may return and the level of normal mortality may rise again, within the next thirty years? Let us dismiss this possibility from our mind for the present and assume that the gains are permanent. *We shall enquire whether, on a comparison of 1921-30 with 1931-40 and the latter with 1941-50, there is such a definite trend as regards changes either of mortality rates or of maternity rates or both that we should expect the growth of population during 1951-80 to be substantially faster or substantially slower than during 1921-50*

7 For information on these trends we have to turn to the statistics of registration of births and deaths— which, as already explained, are defective in many ways. In the country as a whole, the system of registration has been

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in force throughout the period 1921-50 in roughly three-quarters of the country (on a population basis). The following table shows the numbers of births and deaths which were registered in each of the three decades, as well as the average birth rates and average death rates for each decade derived therefrom :

TABLE 5

<i>Decade</i>	<i>Registered births (IN LAKHS)</i>	<i>Registered deaths (IN LAKHS)</i>	<i>Mean decennial birth rate (Registered)</i>	<i>Mean decennial death rate (Registered)</i>
1921-30 .	669	502	33·7	25·3
1931-40 . .	753	512	33·8	23·0
1941-50 . .	680	486	27·2	19·4

Before proceeding to draw any inferences from these figures we should observe that the birth rate is deduced to be 27·2 for the decade 1941-50 when we have already in an earlier chapter, concluded that the correct level is 40. Evidently, 32 per cent of all births escaped registration during 1941-50 (apart from the fact that the births occurring among a quarter of the population were not attempted to be registered at all). Similarly, the registered deaths yield a death rate of 19·4 when we have reason to believe the true death rate was 27. It follows that 28 per cent of all deaths escaped registration during 1941-50, in the areas where registration was being effected.

8 It is usual to assume that the rates derived from the registration data for different years may be compared with one another and correct conclusions drawn regarding time-trends even though the absolute values are incorrect. The assumption would be justified so long as we are dealing with areas in which the omissions are not unduly large and with periods during which the system was worked with much the same degree of efficiency year after year, without any material improvement or deterioration. Whether this assumption holds good of the comparison between 1921-30 and 1931-40 is doubtful ; it is certain that it is wholly inapplicable to the comparison between 1931-40 and 1941-50 even in those states where the omissions are not unduly large. This negative conclusion is so important that the reasons should be placed on record:

First,—We may observe from the figures of TABLE 5 that it is not merely the registered birth rates and registered death rates which have fallen, the absolute numbers of registered births and registered deaths have also fallen. This raises the suspicion that what we are witnessing may not be a fall in the number of births but a rise in the number of births which have escaped registration.

Secondly,—The suspicion is confirmed when we compare the difference between the birth rate and death rate, with the growth rate ascertained by the census. The difference is 7·8 during 1941-50 against a growth rate of 13·1 whereas it had been 10·8 during 1931-40 against a growth rate of 12·7. To put the matter in another way, the registered rates show the birth rate to have fallen more rapidly than the death rate. If we may ignore the effects of migration, this would mean a substantial reduction of the rate of growth. But the census figures show that there was no reduction of the rate of growth. We have good reasons to believe that migration cannot have affected the rate of growth in the country as a whole by even as much as one per cent (though the position is different in certain zones). The figures confirm the suspicion that the system of registration of births and deaths might have been working much less efficiently during 1941-50 than in 1931-40. The comparison between the decades may be bringing to light a fall in the registration of births and not necessarily a fall in the actual number of births.

The point was specially examined by every Superintendent of Census Operations in relation to conditions in his state. The converging testimony of all officers— which will be found in the State Census Reports— confirms the view that there has been a definite deterioration in the efficiency of registration. This conclusion need not cause any surprise. During the war and for some years thereafter, the district administrative establishments were loaded with too much new work in connection initially with the prosecution of the war and later increasingly with the problem of keeping food supplies moving and prices under control. 'Routine' work of every description suffered, including the maintenance of adequate supervision over the staff entrusted with the duties of registration of births and deaths and submission of returns relating to them.

Comparison of the data relating to 1921-30 with those of 1931-40 is not vitiated in the same way; though, even here, it seems possible that special efforts undertaken in some areas to improve the efficiency of the system may have also introduced an element of non-comparability.

9 We may now make the following observations on the figures for India in TABLE 5 :

- (i) The registered birth rate was the same during 1931-40 as during 1921-30. This is probably true also of the actual birth rate.

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- (ii) The registered death rate during 1931-40 was smaller than that of 1921-30. There was probably a genuine fall in the actual death rate.
- (iii) There are large reductions, both in the registered birth rates and registered death rates, when we compare 1941-50 with 1931-40; the reduction of the registered birth rate actually exceeding that of the registered death rate. It should not be supposed that the true birth rates and true death rates changed in this manner. It is not possible to say, from these figures alone, whether they changed at all; and if so, how.

10. Among the states where births and deaths are registered, there are only four in which it has been computed that the omissions are fewer than one in four during 1941-50; and consequently, even smaller, in earlier decades. These are, in order of efficiency of registration: Punjab, Madras, Madhya Pradesh and Bombay. Let us observe the trends disclosed by the registration data in these states, as shown in the table below:

TABLE 6

State	Natural division	Registered birth rate			Registered death rate		
		1921-30	1931-40	1941-50	1921-30	1931-40	1941-50
Punjab	Himalayan	34.7	35.8	34.1	31.4	26.9	23.8
	Plain	41.2	43.6	40.0	30.3	26.3	23.9
Madras	Deccan	35.7	38.5	33.1	25.7	26.1	22.7
	West	35.8	35.0	31.3	22.2	20.6	18.3
	North	30.9	34.7	30.5	21.3	22.4	20.7
	South	31.0	34.0	30.4	21.9	21.9	20.7
Bombay	Deccan—Northern	38.9	39.5	35.3	27.7	26.0	24.4
	Deccan—Southern	37.4	38.5	36.0	27.2	26.3	24.5
	Gujarat	36.2	38.9	36.2	26.7	26.6	24.8
	Greater Bombay	18.8	25.4	23.1	28.1	21.1	16.0
	Konkan	33.9	33.0	27.0	23.3	21.3	18.3
Madhya Pradesh	North-West	41.2	43.7	36.8	32.5	35.0	31.5
	East	39.4	39.2	35.2	29.8	27.8	28.1
	South-West	43.8	41.1	39.4	33.3	33.6	32.1

Though we have had to exclude all the areas where the registration data are too defective for purposes of assessing trends, we are left in TABLE 6 with figures for sufficiently large and widely dispersed areas in the country. Whatever inferences are legitimately drawn from these figures would probably reflect the

true position in the country as a whole. The following inferences seem credible to the present writer.

- (i) *Changes between 1921-30 and 1931-40*—The general picture is made up of two features : *one*—a definitely rising or stationary birth rate ; and *the other*—a significant, though rather small, fall in the death rate. The rise in the birth rate was probably associated with a passing change in the age structure, reflecting the abnormal consequences of selective mortalities of influenza, plague and famine in earlier decades. In some places (e.g. North Madras and South Madras) the rise may be probably deceptive and indicative merely of the results of special efforts to improve the efficiency of registration.
- (ii) *Changes between 1931-40 and 1941-50*—The general picture is made up of two features : *first*,—there is a fall in the birth rate which consists in part of the cancellation of the rise which had occurred in the earlier decade and in part also of a further fall below the levels reached in 1921-30 ; and *secondly*,—there is a further drop in the death rate between 1931-40 and 1941-50 which is a shade more pronounced than the drop which had occurred between 1921-30 and 1931-40.

Where an earlier increase in the birth rate (or death rate) had been due to improvement in the registration of births and deaths, it is almost certain that the improvement was not maintained and a set-back occurred. To this extent, there was no real change in either decade. It is also possible that—even where there was no special improvement originally—deterioration in registration has occurred in the last decade and has exaggerated the trends. After making due allowance for such vagaries of registration, it is difficult to rule out the possibility that the true birth rate of 1921-30 might have been a little higher than the true birth rate of 1941-50 (*viz.*, 40). We should accept it as probable that there has, in fact, been a small reduction of the birth rate. We are on much firmer ground about the death rate. The trend of the death rate differs from that of the birth rate in two ways : the former has fallen in both decades successively, whereas the latter has moved up and down; *and*, the drop in the death rate is clearly visible to the naked eye, while that of the birth rate is microscopic.

II. The fact that the true death rate of 1941-50 must have been definitely lower than the true death rate of 1921-30 is brought out independently by the Life Tables which have been computed for the two periods—by Shri L. S. VAIDYANATHAN for the former and by Shri S. P. JAIN for the latter. The life table data are fully discussed in Shri JAIN's report. The salient features are as follows.

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The expectation of life, at any particular age, is a good index of the net result of the incidence of mortality at all subsequent ages. But the nature of the data used for purposes of calculation is such that a good deal of guess-work enters into this factor at very young ages. The values of expectation of life at birth must, therefore, be treated with some reserve; but the values for expectation of life at higher ages may be relied upon more confidently. The relevant figures are shown below.

TABLE 7

	1921-30	1941-50	<i>Increase in expectation of life during 20 years</i>
Expectation of life at birth	26 years and 11 months	32 years and 5 months	5 years and 6 months
Expectation of life at age 10	36 years and 5 months	39 years	2 years and 7 months

These figures leave no room for doubt that there has been a significant increase in the expectation of life—which is the same thing as a significant decline of mortality rates. This conclusion indicates a trend of which we should take notice when making estimates of future growth. But before following up that point, a brief digression is necessary in order to prevent the possibility of any sense of complacency arising out of our finding that the death rate has, in fact, fallen and the expectation of life has increased.

12. The expectation of life at age 10 is 59.0 to 60 in England and Wales, Australia and New Zealand. It is 56 in the United States of America, about 50 in Japan and 47 in Egypt. It is ~~now~~ 39 in India. We continue to retain the unpleasant distinction of having the lowest expectation of life among all the peoples for whom figures are available.

13. We should also remember that preventable deaths continue to occur in especially heavy numbers among infants and young children under age 5. Our information about mortality rates at different ages is very poor. The best judgment which the present writer is able to form on this subject from available data is furnished in TABLE 8 on next page.

TABLE 8

	<i>Number of deaths occurring among 1,000 persons of all ages during any one year (1941-50)</i>			
	<i>All ages</i>	<i>Under age 5</i>	<i>Ages 5 to 54</i>	<i>Ages 55 and over</i>
South India (Madras)	21 or 22	8 or 9	7 or 8	6
West India (Bombay)	26	11	9	6
North India (Uttar Pradesh)	27 or 28	11	10 or 11	6
Central India (Madhya Pradesh)	34	15	13	6
INDIA	27	11	10	6

In all the four zones for which available data permit a judgment, it will be seen that the number of deaths occurring under age 5 equals or exceeds the number of deaths occurring at all ages between 5 and 54; and is substantially in excess of the deaths occurring among elderly persons aged 55 and over.

14. The mortality of children under age 5 is heavy. Among them the mortality of infants, who die before they complete one year of age, is especially heavy. It is true that our infant mortality rate is diminishing. During the decade ending 1931, it was 176 infant deaths per 1,000 births. During the next decade, it was 164. During the last decade, it was 152. These are the figures based on registration. When we allow for omissions in registration (which are almost certainly more numerous among infants who die shortly after birth than among infants who survive), the true rates would probably be higher than these figures (which are, even as they stand, extremely high). We have seen that out of 27 deaths of persons of all ages (which occur annually among 1,000 persons in India) 11 deaths occur among children under 5 years of age. Out of these 11 deaths, it is almost certain that 7 occur among infants who have not completed one year of age. This appalling waste of life and maternal suffering, so largely preventable, goes on day after day in all parts of the country. Madhya Pradesh seems to have an unenviable distinction. Whereas in the country as a whole, 40 child births occur every year among 1,000 people, Madhya Pradesh has 44. Whereas in the country as a whole, 7 infants die before they are one year old, the number in Madhya Pradesh is 11. The entire excess of births is matched by an equal excess of infant deaths.

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15. Let us now leave these unpleasant figures behind and resume our discussion of trends during the last three decades. We may be satisfied that there has been a real drop in the death rate from decade to decade. The drops are real though they are small. They reflect the modest success, which has undoubtedly been achieved in successive decades, in reducing the incidence of premature death of the type which is normal in our country

What about the rise and fall of the birth rates, from which we concluded that there was perhaps a net diminution of the birth rate to a small extent during 1941-50 as compared with the level of 1921-30? The changes would appear to be attributable to two causes of which one is indicated by the figures in the table below :

TABLE 9

Decade	Age-group	Number of married females per 1,000 persons of both sexes and all ages in			
		Uttar Pradesh	Madras	Bombay	Madhya Pradesh
1921-30	{ 15-24	74	73	72	75
	{ 25-34	71	71	69	73
	{ 35-44	42	38	37	43
	15 to 44	187	182	178	191
1931-40	{ 15-24	76	74	78	80
	{ 25-34	72	70	70	75
	{ 35-44	43	38	36	42
	15 to 44	191	182	184	197
1941-50	{ 15-24	73	67	74	69
	{ 25-34	70	69	71	76
	{ 35-44	46	42	40	46
	15 to 44	189	178	185	191

NOTE— The figure for each decade is arithmetical mean of two figures computed from the data relating to the censuses at the beginning and end of the decade

It will be observed that the figures of Madhya Pradesh, Bombay and Uttar Pradesh show significant increases in the numbers of married women of child-bearing age from 1921-30 to 1931-40, while those of Madhya Pradesh and Madras show significant decreases from 1931-40 to 1941-50. A detailed analysis of such changes in Madhya Pradesh (the analysis took into account changes within natural divisions) shows that they must be due to the distortions caused by selective mortality inflicted by the great influenza epidemic on a generation

whose age structure had been distorted by the great famines of the decade 1891-1900. There is little doubt that, where there are real ups and downs in the birth rate (and not merely ups and downs in the efficiency of registration of births), the principal operative cause has been the changes in the age-sex structure arising in the manner just described. That is probably the correct explanation of the ups and downs of the birth rate. But is it a complete explanation also of the finding that there is a net resultant drop? It is very difficult to say. It is not impossible that the average age of marriage of girls may have risen somewhat and caused this net resultant drop. The rise in the age of marriage may have come about, as a result of the Child Marriage Restraint Act of 1929—even though (as pointed out in an earlier chapter) the law still continues to be disregarded by quite considerable numbers of people in many parts of India. It must be borne in mind, however, that the net resultant drop, for which an explanation is sought, is so very small that the reality of its existence has to be established by elaborate argument.

16 In the light of this review of the past what do we infer about the future?

So far as maternity is concerned, our assessment of the past does not indicate a trend which would justify us in assuming any very materially different future unless something happens which leads to the wide-spread adoption of contraception—a contingency which we shall reserve for later discussion. The position is different about mortality. Our assessment of the past would justify us in assuming that a further decline of mortality might take place in the next thirty years. It is perfectly obvious that a large proportion of deaths which occur at present are preventable. There is, therefore, quite considerable scope for reduction of mortality, especially among infants and very young children.

It follows that (unless the rate of growth of population is checked by contraception or a breakdown of food supply of such a serious nature as to entail a

TABLE 10

Year	Population (IN CRORES)
1951	36
1961	41
1971	46
1981	52

return to the abnormal mortality conditions of 1891-1900) population will increase during 1951-80 at a faster rate than during 1921-50.

Nevertheless, it is expedient for purposes of further discussion that we should accept a forecast which errs on the side of under-statement rather than the contrary. With reference

to the two sets of figures already mentioned (in TABLES 2 & 4) let us finally assume that the future growth of population will be as shown in TABLE 10.

17. We have seen that during the three decades before 1951, cultivation *per capita* has been steadily declining and food shortage growing. We shall examine, in the last section, whether these tendencies will be arrested and reversed during the next three decades. In doing so we shall endeavour to think *quantitatively*. *Shall we be able to develop agriculture so as to keep pace with the numbers specified in TABLE 10?* That is the question we shall seek to answer.

Before we start, let us be quite clear about this—our growth in numbers may prove to be even faster than is shown by TABLE 10. It will not be slower. It is nearly as certain as any prediction can possibly be that our number will rise to 52 crores round about 1981, *unless any of the two developments occurred beforehand*. The first of these conceivable developments may be described as the 'catastrophe'. Our food shortage which has grown in the past, in the manner described in the last chapter, might—if permitted—grow still further, with the result that the distribution of food supplies might breakdown (as it did in 1943, in Bengal). If this happens over extensive areas for a few years in succession, it will bring in its wake famine and epidemic diseases on the scale which prevailed during 1891-1900. Our assumption that 1951-80 will be governed by the trends of 1921-50 in respect of mortality, would have broken down.

The second contingency may be described as the 'near-miracle'. Our womenfolk might begin to practise contraception and voluntarily limit child-bearing, as they are doing in Western European countries today. In that case, our assumption that 1951-80 will be governed by the trends of 1921-50 in respect of maternity, would have broken down.

18. If we assume (as most people would like to do) that the 'catastrophe' will not be permitted to occur and that the 'near-miracle' should not also be counted on, then we are committed to the development of agriculture at a rate sufficient to feed *at least* 52 crores of people in 1981. Can we do this? The answer to this question, according to the best judgment of the present writer is in the negative. The reasons are explained in the next section. The conclusion is then drawn that we must count on the 'near-miracle' and bring it about while we are developing agriculture as fast as we can. This view is explained in the next succeeding section of this chapter.

B — *Agricultural Productivity : development targets*

19 When we discuss agricultural development and frame programmes and targets therefor, it is convenient to use two different terms—'productivity' and 'production'—to signify two different things. We often hear, for instance, of planning the production of rice or wheat so as to get so many lakhs of tons in such and such a year. But that is not possible. It may be possible to plan ahead the production of a particular year in mines or factories, but it is not possible to do it on farms. For, the monsoons are (at any rate at present) beyond the control of man. The vicissitudes of the seasons alter the yield of crops, from one year to the next, by much larger amounts than any increase which can be brought about by human contrivance within the same time. This does not mean that agricultural development cannot be achieved by planning. On the contrary, we have perhaps reached a stage in the development of agriculture when further development is unlikely to occur on any significant scale without planning and state-aid. But we should be clear that what we seek to increase by planned development is *not the production of any particular year ; but the 'average level of production'*—above and below which the production of particular year fluctuates in response to seasonal conditions. Much error and confusion will be avoided if this distinction is borne in mind more firmly than it is at present. Let us use the term '*productivity*' to refer to this 'average level of production', in order to emphasize the fact that we are *not* referring to the *production* of particular years.

20 It is useful to go a step further and dot the *i*'s and cross the *t*'s of the definition of 'productivity' so that it might become possible to measure it like the birth rate or the death rate or similar useful statistical concepts. A difficulty is presented by the fact that the same land is used in different seasons (sometimes even simultaneously) to grow different crops. When we raise the productivity of a plot of agricultural land, we can grow more rice or more jute, more millets or more cotton—more or less as needed. Development of productivity is one thing, and the allocation of increased productivity to different alternative uses is another. It is not unusual for people to imagine that productivity has been increased when there is merely diversion from, say, short staple cotton to millets or from millets to groundnuts. We cannot add up the weight of different crops and arrive at a single total of the combined weight of all crops. So we need a conventional method of establishing equivalence between different crops, in order to arrive at a single yardstick for the measurement of productivity.

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Let us accept two conventions. *First*, — all foodgrains (when they are clean, dry, dehusked and fit for human consumption) may be regarded as equivalent to one another, maund for maund, and added up on that basis. *Secondly*, — the productivity of any plot of agricultural land is the weight of the average annual yield (*less seed**) of foodgrains actually grown on such land ; provided that where a crop other than a foodgrain is grown, it is assumed that the foodgrains normally grown on such land or similar land in the vicinity had been grown instead

21 With the help of these conventions we may fix the present level of productivity of agriculture in India as follows : We have already assumed† the average yield (*less seed*) of foodgrains cultivated in India (as an average of five years preceding 1951) was 556 lakhs of tons. The gross area sown to foodgrains is 78 per cent of the gross area sown to all crops. The total productivity may therefore be assumed as $[556 \times 100/78, \text{i.e.}]$ 700 lakhs of ANNUAL tons.

22. Seven hundred lakhs of ANNUAL tons round about 1951 is then our starting point ; when our total number was 36 crores. What is the level of productivity needed round about 1981, when we expect our number to have grown to 52 crores ? Before we estimate this, however, we should take note of the shortages which were present round about 1951.

The shortage of foodgrains has already been estimated. Round about 1951, the annual average was 34 lakhs of tons. There are known to be shortages of smaller order in other crops also. *Let us, therefore, assume in round figures that 750 lakhs of ANNUAL tons of agricultural productivity are required in order to feed and clothe 36 crores of people at the current levels of consumption. This is the same thing as saying 5 ANNUAL tons are required for every 24 persons.* At this rate, we can compute what we shall need by way of agricultural productivity in 1961 when we shall be 41 crores ; in 1971 when we shall be 46 crores ; and in 1981 when we shall be 52 crores— *if we are to overcome existing shortages and maintain current levels of consumption without deterioration.* The results are shown in TABLE II on next page.

*It is very necessary that seed should be deducted from the gross yield (among other reasons) because the proportion of seed to gross yield is very different for different crops

†cf. Chapter IV, para 64, and APPENDIX V

TABLE II

Year	Population (IN CRORES)	Needed agricultural productivity (IN LAKHS OF ANNUAL TONS)	Targets of development of agricultural productivity (IN LAKHS OF ANNUAL TONS)
1961 . . .	41	850	150
1971 . . .	46	960	260
1981 . . .	52	1,080	380

23. As long as the population grows, our agricultural productivity must also grow. Our target for development is, therefore, a moving target which is indicated by the figures of the last column of TABLE II. If we express these figures as percentages of the level of productivity prevailing in India round about 1951 (viz., 700 lakhs of ANNUAL tons), we may say that the increase required is of the order of 21 per cent before 1961, 37 per cent before 1971 and 54 per cent before 1981.

Let us recall the fact that we have taken care to avoid over-estimating either the probable increase of numbers or the probable requirements of food-grains per head of population or the probable proportion of all crops to food-grains*. The targets set out in TABLE II are, therefore, minimal estimates of the scale and tempo of development which are essential if existing shortages are to be overcome and if we are to supply the food and cloth needed by our growing numbers out of the produce of our land. If our future rate of development of agricultural productivity falls short of these targets we must expect to have less food and cloth to go round for all, or to have to import more foodgrains or more cotton or both.

24. No one is likely to dispute these statements. In fact, everyone is anxious to see that agricultural productivity is developed as rapidly as possible. The Central Government and all the State Governments are concentrating their

*The last mentioned point is especially important. The high proportion of foodgrains (especially cereals) to all crops in our cultivation reflects the high proportion of foodgrains (especially cereals) in our diet. If we are to have more vegetable oil and more ghee, more milk or butter-milk, more vegetables and fruits, more sugar and spices in our food (and more of these are badly needed if we are to have better nutrition) we should increase the proportion of foodcrops other than foodgrains. At present we cannot do this because any increase in such crops cannot be secured except at the cost of a more than commensurate loss of cereals, which we cannot afford. This point should, however, be noted that the targets of development specified in TABLE II are framed in the sense that they do not include provision for material improvement of current living standards.

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energies on it. Our First Five Year Plan, it is well known, has placed the programmes needed for this development in the forefront. About 45 per cent of the planned expenditure on all development schemes is earmarked for the development of agriculture, irrigation and power. Funds necessary for these purposes, it is agreed, are to be made available on a very high priority. What is not, however, equally clear is whether the schemes are sufficient to solve our problem. Let us examine how far the schemes included in the Plan will take us towards the attainment of the targets of TABLE II. How much will remain to be provided by future Five Year Plans ?

25. The most reliable as well as the most durable of all the methods of increasing agricultural productivity is to increase the irrigated area. This involves construction of new irrigation works or improvement of existing irrigation works. It is well known that schemes for the development of irrigation are placed in the forefront of all schemes for the development of agricultural productivity in the First Five Year Plan. All are familiar with the great multi-purpose river valley projects, as well as numerous other irrigation projects (major and minor) which are either under construction or are about to be undertaken. Though they are well known, it is to be doubted whether there is a correct quantitative perception of the scale of the undertaking or realisation of the fact that, *in the literal sense of the phrase, it is altogether unprecedented in the history of the world.*

26 To begin with, we are far too apt to imagine that our country is poorly equipped with irrigation, as compared with other countries of the world. From this it is deduced that we have a much larger leeway to make up than other countries. This is entirely wrong. We can have a correct idea of the immensity of the task which we have undertaken only if we realise the truth, which is—we have already gone very far in developing the use of usable resources of water, just as we have already gone very far in developing the use of usable resources of land. Unfortunately, the true position cannot be established by figures because it is very difficult to get hold of comparable statistics of irrigated area in different countries. Such figures as there are go to show that India irrigates a higher proportion of its crops than the world as a whole and that probably no other large country except China irrigates a higher proportion. In particular, the proportion of irrigated area to gross area sown is much smaller in Europe or North America than in India. The relevant figures for India, round about 1951, are given below.

India's cultivated land now measures 2,867 lakhs of acres. The gross area sown is just over 3,244 lakhs of acres, the difference being the area sown more

than once during the same year. Out of 3,244 lakhs of acres sown, the crops on no less than 503 lakhs of acres are irrigated. The irrigated area is thus 15·5 per cent of the total area sown. The proportion of irrigated area for different zones is shown in the table below :

TABLE 12

Zone	Percentage of irrigated area to area sown*
North India . . .	23·4
East India . . .	17·0
South India . . .	25·8
West India . . .	4·8
Central India . . .	5·3
North-West India . . .	24·3
INDIA . . .	15·5

27. We must have some idea of the rate at which irrigation has developed in the past if we are to assess correctly the scale of the effort we are making for the future. How many of the works which at present provide irrigation for 5 crores of acres antedate British rule — we have no means of computing. It is certain that some of them are well over two thousand years old. It is probable the greater

part of the present irrigated area had been brought under irrigation long before British rule. It is, however, characteristic of irrigation works that they fall into disrepair and disuse in times of anarchy and misrule and get restored and improved under conditions of settled administration. There is little doubt that a good deal of restoration and improvement of this nature has taken place during the last century. It is also certain that considerable development has also occurred through the construction of private wells and other small scale works undertaken by farmers themselves. Such development was also fostered by the grant of loans and concessions in respect of land revenue and rent. In addition to all this, it is a fact that very large areas were newly brought under irrigation by major irrigation projects constructed as public enterprises within the last century.

We have got detailed and accurate information about this. It has been reckoned that the total area irrigated by public works projects (for which capital and revenue accounts have been maintained) is 291 lakhs of acres in undivided India. Out of this, it is estimated that 142 lakhs of acres are in areas now in Pakistan. The development of irrigation, within India in its present limits, was 149 lakhs of acres. It took roughly a century for this development to

*The area of cultivated land (or net area sown) should be distinguished from the total (or gross) area sown. Similarly the area of irrigated land is distinguishable from the total area irrigated. The most appropriate comparison is between the total area irrigated and the total area sown.

occur. The table below shows the break up of this total by zones and periods of construction :

TABLE 13

Zone	(IN LAKHS OF ACRES)			Total
	Constructional period			
	Before 1891	1891-1920	1921-1940	
North India .	32.5	5.1	18.2	55.8
East India	5.1	7.0	.	12.1
South India . .	12.6	13.1	2.4	28.1
West India .	0.7	1.6	1.5	3.8
Central India .	..	0.7	5.9	6.6
North-West India	27.5	9.1	6.4	43.0
INDIA . .	78.4	36.6	34.4	149.4

The figures indicate a fairly steady, but slowly diminishing, tempo of construction. The marked inequalities of development in the different zones should also be noted. One should not imagine this involves arbitrary preference for some areas and neglect of others. North India, North-West India and South India presented much better scope for profitable development than West India and Central India. East India was better provided by nature with rainfall and soil moisture than other zones and was less in need of new works of irrigation.

28. We must not under-estimate the scale of the effort which the figures of TABLE 13 stand for. We can appreciate how large an undertaking it was, if we compare this history of development with that of the United States of America as indicated by the following passage from the report of the Hoover Commission :

" At the time, the great multi-purpose projects were inaugurated, the earlier projects of irrigation had been largely completed and were furnishing water to about 2,790,000 acres. In the 18 years since that time about 1,500,000 acres of additional soil have been brought under irrigation with perhaps another 550,000 acres more benefiting indirectly from the water supplied by the multi-purpose projects "

CHAPTER V : THE PROSPECT—1981

It is evident that the development of irrigation by the construction of large scale public works projects was undertaken in India on a much larger scale and carried out at a much faster pace than in the United States of America

29. Now, it is scarcely credible but nevertheless true that the First Five Year Plan includes major irrigation projects which are calculated to bring more area under new irrigation than the entire area brought under new irrigation by all major irrigation projects which were constructed during a century of British rule. The relevant figures are shown in the table below :

TABLE 14

Zone	Irrigated area under major projects* (IN LAKHS OF ACRES)	
	Projects constructed during the last century	First Five Year Plan Projects
North India . . .	55 8	19 5
East India . . .	12 1	55.0
South India . . .	28 1	10 3
West India . . .	3 8	10 5
Central India . . .	6 6	10.7
North-West India . . .	43 0	54.9
INDIA . . .	149.4	160 9

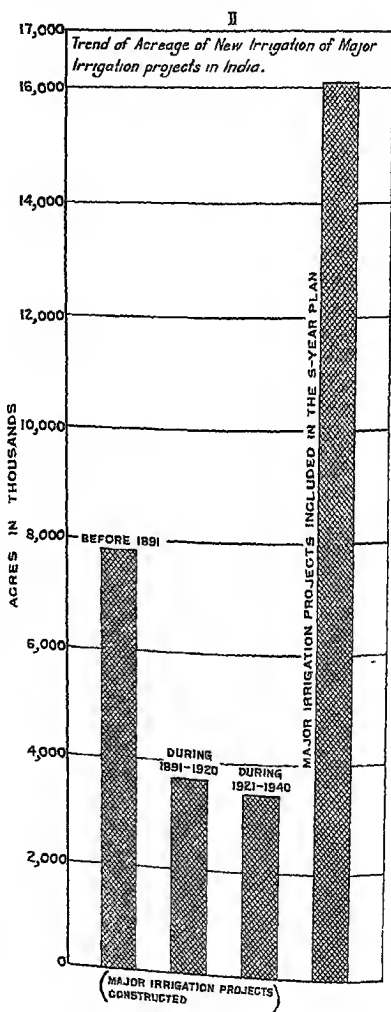
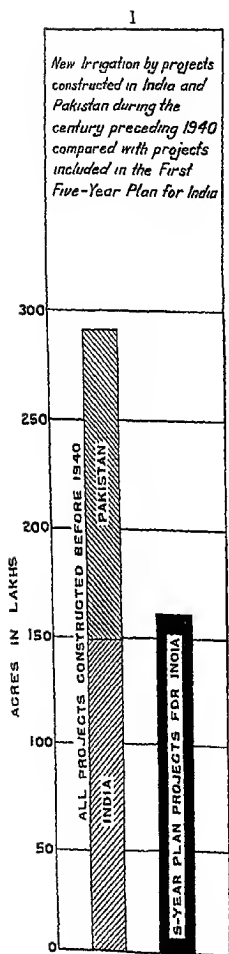
A complete specification of the individual projects, of which the planned results are shown in the last column of this table, will be found in the papers printed as APPENDIX VI

30. Judged in the light of the scale and tempo of past development the present undertaking appears to be so stupendous that it may well be asked whether the planned results are not seriously over-estimated. *There is no reason to believe they are* It is true that no one can be absolutely certain of the

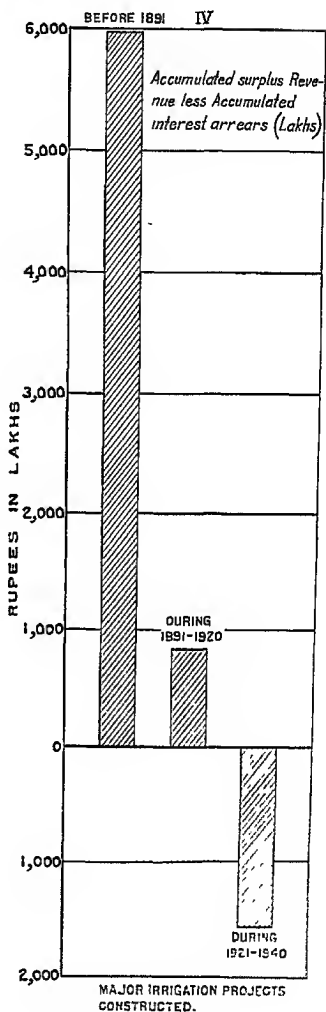
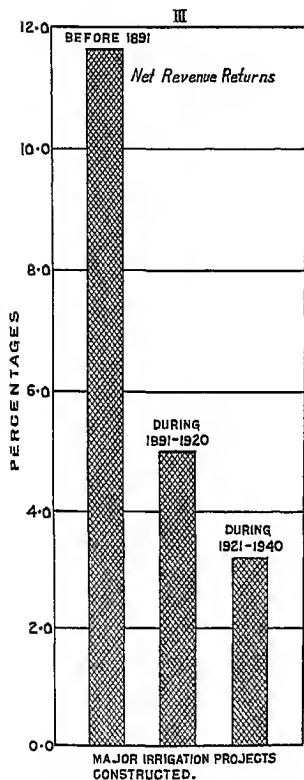
*These figures relate to irrigation benefits from these projects on completion. The five multi purpose projects—Kosi, Koyna, Chambal, Rihand and Krishna Valley on which work has yet to be started and certain tube-well schemes in Uttar Pradesh which would be completed in 1966-67, are excluded

Development of Irrigation — Major Projects

DEVELOPMENT OF IRRIGATION MAJOR IRRIGATION PROJECTS



TREND OF FINANCIAL RETURNS



results of any undertaking until one has got them. But there is no justification for misgivings, because planning of major irrigation projects is not a new task. The engineers of North-West India, North India and South India have got nearly a century of experience to go upon. The projects may indeed take somewhat longer to complete than eager people may desire. The people may take time to adapt the land under these projects to irrigated cultivation. Even after irrigation starts, it may take a little time before the yield increases to the normal level of irrigated crops. Experience shows that we must be prepared for all this. But, there need be little doubt that the availability of water would have been correctly estimated and *the planned extension of irrigated area will, in fact, take place.*

31. Now, it may be asked if all this is now possible, why was it not attempted before ? It is necessary that we should ask this question explicitly and make sure that we have answered it correctly. The right answer is to be found in the relation between costs and results. An analysis of costs and results of the old major irrigation projects and the major development plan projects under the First Five Year Plan is made in a note printed as *Part B* of APPENDIX VI. The main conclusions are as follows. In the old days, the selection of projects for execution was limited by the consideration that the net revenue return should suffice to render the enterprise a profitable undertaking for the state. [There were well-recognised exceptions to the rule, but they were limited.] We have discarded this limitation, and hence the large scope for development which we are now using up. It is necessary, however, to face the fact that, with every new advance made in the utilisation of usable water supplies, the real cost (and not merely the money cost) of new works necessary for making a further advance has been increasing. *The figures make it quite clear that the 'law of diminishing returns' is in effective operation and that every acre of new irrigation has to be subsidised by the general tax-payer.* The diagrams which precede this page illustrate clearly the enormous scale of the development which we have undertaken, as well as the trend of diminishing returns against which we have to contend. This situation is not peculiar to India. It exists in the United States of America also*. India is distinguishable from United States only in the fact that here the need for an uphill struggle to get water for irrigation, even at a loss, is very much more urgent and imperative.

32. What is the probable increase of agricultural productivity to be expected when, as planned, these projects are completed and 161 lakhs of acres are brought under irrigation ? The detailed data necessary for making a firm estimate

*of APPENDIX V, Part B.

these advantages. Unless, however, these arrangements are perfected and efficiently operated in such states also, it may not be possible to spend the money provided or money may be spent without securing an equivalent increase of productivity. That is one important consideration. There is another. No scheme of subsidisation of private works will succeed unless the subsidy was carefully adjusted. If the subsidy is lavishly given, the development of productivity will be too small in relation to the expenditure; and progress will be too slow and too costly. If, on the other hand, the subsidy is not clearly adequate, it will fail to induce cultivators to undertake improvements. The subsidy must be sufficient to reduce the net investment by the cultivator to a level at which he could be assured of a profitable return. As large numbers of cultivators have already been induced by loans and subsidies to carry out such works during the last few years, it should be possible to settle—in the light of experience—which is the right subsidy to be offered. It would be surprising if the requirements turned out to be smaller than the average rate of Rs. 100 per acre provided by the Planning Commission. The cost figures of at least two zones—where much smaller figures are provided—would seem to call for upward revision, if the indicated targets are to be attained.

34 This programme, it has been reckoned in the report on the First Five Year Plan, is calculated to increase productivity by 24 lakhs of ANNUAL tons. From what has been said above, it seems reasonable to conclude that the chances of the entire programme being implemented within the next two or three years are poor. More time will be necessary, and, very probably, more money also. Experience must show the practicable rate of progress and necessary cost. The rate of progress can, indeed, be rapid if adequate administrative, financial and technical arrangements are perfected and the cultivators are properly organised to cooperate with one another and with the local officers of Government. How to bring about such organisation is a question which admits of no simple or ready-made answer. It is known, however, that active steps are being taken to find the answer and perfect the arrangements. For our present purposes, we may, therefore, assume that the two parts of the programme of irrigation development—major irrigation projects at present estimated to cost 445 crores and minor irrigation schemes at present estimated to cost 77 crores—will be put through; and that they will yield, in reasonable time, an increased agricultural productivity of the order of (36+24, i.e.,) 60 lakhs of ANNUAL tons. *When we have got it, where shall we be? We shall have secured just about two-fifths of what we need by 1961.*

35. Irrigation, of course, is not the only means of increasing yields. There is 'fertilisation'—the effort to increase the supply of mineral fertilisers as well as organic fertilisers and green manure. This effort merges in the various measures by which cultural practices are improved—the use of the right seed, proper preparation of the seed-bed and care of the seedling, the protection of the growing plant against pests and diseases, etc. Lastly, there are arrangements for reclaiming waste land as well as land which has gone out of cultivation owing to the growth of deep-rooted weeds. The latter is closely linked to development of the use of tractors. There is no doubt that every one of these different types of schemes will contribute something towards the attainment of our target. But how much would that contribution be and when shall we get it? In attempting to answer this question, we enter the arena of high debate—for we deal, mostly, in opinion. There are few reliable statistics based on adequate experience in the country. We have, instead, varying moods of optimism and pessimism.

Data regarding responses to the use of mineral fertilisers are coming in, in recent years, and we are perhaps already in sight of a firm basis for quantitative assessments. Even then, we should pass beyond the purely technical relationship between quantities of fertilisers and quantities of additional yield. We should count the cost—as we have done about irrigation. We should take account of the arrangements necessary for ensuring that the fertilisers are distributed at a price at which it will be remunerative for the cultivators to use them on the production of foodgrains. Here again, we should face the fact that we are probably up against the impossibility of progress without subsidisation.

When we turn from mineral fertilisers to all other measures for the improvement of cultural practices, it is extremely difficult to achieve a realistic and measurable basis such as we need when we are dealing with the vitally important issue of assessing the prospects of food supply of the people.

36. The rest of this section is devoted to a purely subjective assessment, by the present writer, of the prospect for increase of agricultural productivity. The assessment is not based on any statistical projection of 'natural' growth; for we may be sure it would be very small—probably negligible. *It is assumed that the preponderant part, if not the whole, of future development will be secured as a result of public works which will not be fully self-financing, as well as by state-aided and state-subsidised private effort on a nation-wide scale.* On this basis, the question is not merely what is technologically feasible (though that is very important), but also how much unremunerative outlay and how much subsidy are involved. The idea that development can be achieved without

counting the cost is unpractical. Concentration on subsidised development of agricultural productivity will involve a corresponding retardation of the effort to improve communications, housing, hygiene, health, education and the amenities of life. There are limits to the extent to which such developments can be retarded without creating so much disappointment and discontent as to prejudice the success of the whole conception of planned development

37. Our present level of gross area sown (reckoning the double-crop area more than once) is 32 crores. What is it likely to be in 1981 ? It is suggested that 35 crores is probably about the limit. We have found, in Chapter I, good reasons for believing that India has already brought under cultivation an exceptionally large proportion of usable land. It is common knowledge that over very large areas, land which should have been reserved for use as woodland or pasture has been brought under the plough. In a great many villages we shall indeed need *a carefully organised survey of waste lands, in order to localise all the areas which it would still be possible to reclaim and bring under cultivation without excessive subsidisation. In the course of such survey we shall have to ascertain the different forms of state-aid necessary for bringing them under cultivation.* It would, however, be unjustified optimism to imagine that very large areas of land which would yield a return commensurate with the labour of cultivation— even after subsidised reclamation— will be found very quickly. Progress in this respect, will be both small and slow.

It is possible to increase crop-acreages, without extension of cultivation to waste land, if we can increase double-cropping. Here again we already have a very large proportion under double-cropping. The duration of soil moisture is the principal limiting factor and it is doubtful whether there can be much increase, except *pari passu* with the growth of irrigation— especially irrigation under private wells

The assumption that the crop-acreage under both heads can be increased by 3 crores of acres before 1981 is probably optimistic, but not perhaps unjustifiably so. Let us make it. What would be the resultant increase of productivity ? We should assume a rate representing the average of the lower range of yields of unirrigated crops at current standards of husbandry. It is necessary to do this, because estimates of increased productivity consequent on irrigation or other measures for increasing the yield rate per acre should be made separately and no item should be counted twice. On this basis, estimate of increase by one ANNUAL ton on every 8 acres newly added to our crop-acreage would perhaps err on the side of optimism. Let us assume it ; and count an increase of agricultural productivity of the order of 40 lakhs of ANNUAL tons

AGRICULTURAL PRODUCTIVITY : DEVELOPMENT TARGETS

38. We have reviewed the facts and figures about irrigation at considerable length. We have now got 5 crores of acres of irrigated crops. How many acres of irrigated crops shall we have in 1981 ? The First Five Year Plan budgets for an increase of irrigated area of the order of 2.8 crores of acres. The budgeted increase is certainly feasible, though not within the time. There will also, no doubt, be scope for further increases. Let us take a long-term view, in the full knowledge that every lakh of acres newly added to the irrigated area will render the addition of another lakh more difficult and more costly. What shall we assume as the final result of this uphill struggle— 4 crores of acres ? Shall we succeed in increasing the irrigated area of about 5 crores of acres (built up during some thousands of years)— by about 80 per cent— to about 9 crores within the next thirty years. Let us assume that we set this long-term target for ourselves and attain it, through a succession of Five Year Plans. What would be the result ? If we attribute to irrigation the difference between the average yield of irrigated crops and the average yield of unirrigated crops— we would be justified in taking credit for one ANNUAL ton for every five new acres of irrigation*. [In this, we do not take credit for better manuring or other improvement of cultural practices. This comes later] We shall get a total increase of productivity of the order of 80 lakh ANNUAL tons by irrigation. Let us add this to the result of increasing crop-acreage, already mentioned. We shall get increased productivity of the order of 120 lakhs of ANNUAL tons.

39. Let us now take into account all other methods of increasing the yield per acre— mineral fertilisers ; green manuring ; better rotations calculated to improve soil fertility ; the so-called Japanese method of rice cultivation ; improved seeds (already known) , improved seeds which may be expected to be thrown up by research within the next ten years ; contour-bunding and dry-farming ; better protection against pests and diseases ; and greater care and attention to all the processes of cultivation. Every one of these measures will undoubtedly help. We should count on them— but we should not count on them indefinitely. In particular, we should refrain from making a double count of the results attributable to irrigation and to manures— once separately, and once again when assessing the value of particular methods of improving yields per acre. *We should steer clear of a common mistake which consists in confusing these improvements of methods of cultivation which enable us to secure the same yield per acre with less labour, with others which help to increase the yield per acre.* The former (however beneficial) are not relevant to the present discussion. Finally, there is the tendency to attribute increased

*If land is reclaimed from waste and is also brought under irrigation, we assume 1/8th of a ton per acre on reclamation and 1/5th of a ton per acre in addition on irrigation

yields to changes in the system of ownership and management of land. What sort of land reform is calculated to improve farming efficiency is a question on which diverse views are (and will continue to be) held. But we should be careful to distinguish between efficiency in the realisation of technological possibilities which otherwise exist, and the creation of new possibilities. No measures of land reform will *add* to the technological possibilities of cultivation. Well-conceived reforms will remove impediments to their realisation ; ill-conceived changes will create new impediments. Let us not put 'co-operative farming', 'collectivization', 'redistribution of land' and so forth in the same category as water, manures, and improved seed and add up targets of increases attributed to each of them separately. The upshot of all the genuine possibilities which do certainly exist cannot (in the opinion of the present writer) be put higher than the combined effect of the two targets already mentioned—*i. e.*, 120 lakhs of ANNUAL tons. The scale of effort needed to secure this result may be indicated by the break up of the total into three equal parts as shown below:

First,—*Forty lakhs of ANNUAL tons* to be secured by concentrating the use of mineral fertilisers (whose use can be stepped up considerably with advantage) improved seeds and improved cultural methods from about 2 crores of acres of land having an assured supply of water ;

Secondly,—*Forty lakhs of ANNUAL tons* to be secured in the same way as above but without the concentrated use of mineral fertilisers, from about 4 crores of acres of land having a reasonably satisfactory supply of water ; and

Thirdly,—*Forty lakhs of ANNUAL tons* to be secured by better cultivation of about 8 crores of acres of unirrigated land situated in areas with low rainfall. This is the most conjectural item, because known methods (*e.g.*, contour-bunding and dry farming) might not suffice for this purpose. On the other hand, if intensive research could give us some improved seed similar to the 'hybrid corn' of America, the proposed programme may be over-fulfilled.

40. At the end of all this, our estimate of increase of agricultural productivity is still only 240 lakhs of ANNUAL tons; of which one-sixth is to be secured by increase of acreage under crop; one-third by increase of acreage under irrigation, and one-half by all methods of increasing yield per acre other than irrigation. *This increase will fall short of our needs before 1971. It will be just about sufficient to overcome the present shortages and meet our growing needs until our number reached 45 crores— which will occur round about 1969. By that time we shall have completed three successive Five Year Plans,*

each more difficult than its predecessor, and embarked on the fourth. If even then, our population is still growing unchecked, what are the prospects of our being able to continue to force the development of agricultural productivity so as to keep pace with it. Of course, there will never be a point of time at which it can be said that the last improvement has been effected. But if we draw the moral correctly from the many unmistakable signs which go to show that the law of diminishing returns is in effective operation, we should make up our mind to face the fact that *our effort to keep pace with unchecked growth of population is bound to fail at some point*. If the analysis of the subject contained in this chapter is even approximately valid, we should be able to go one step further and *fix this point by saying that it is the time at which our total number reaches and passes 45 crores*.

C — Improvident Maternity : reduction targets

LET US ACCEPT the position that we shall not be able to overcome our existing shortages and also in addition keep pace with the unchecked growth of population. Then, what follows— that food shortage will grow and grow until it ends in a breakdown of food distribution and return of famine and pestilence? That is indeed a dark prospect which 1943 warns us to face as a possibility. But not all events which are possible are probable, and very few are inevitable. After all, we have been failing to keep pace with the growth of population for about thirty years and the life of the people is still being carried on, though not without visible adverse results. We must study the trend of these results in the past, in order to have a realistic idea of what to expect in future.

42. First, it is certain that if agricultural productivity fails to keep pace with the growth of population, our need for imported foodgrains will increase steadily. We may do with a little less in a year following a good monsoon, and need a little more in a year following a bad one; but there is a norm above and below which these fluctuations* take place. It is this norm which has steadily increased during the past 30 years; and it is certain to go up in the future also, unless the development of productivity keeps pace with the growth of population. Round about 1951, we reckoned that the average shortage of foodgrains required to be

*Incidentally, these year to year fluctuations in import needs will be only a fraction of the year to year fluctuations of production.

made good by imported stocks was 34 lakhs of tons. This was the level of the norm at that time. At what rate will it rise in future? Our current rate of consumption of foodgrains is $4\frac{1}{2}$ maunds (or one-sixth of one ton) *per capita* per annum. Our current rate of increase of population is about 47 lakhs each year. Suppose there is no development at all, will our import norm increase by as much as 8 lakhs of tons per annum, from each year to the next? Will the import norm be 74 lakhs of tons per annum in 1956? We touched on this question before*, and our answer must be in the negative. *Experience shows that in conditions of growing food shortage, every newly added consumer does not set up the same demand as the average of all existing consumers. This is somewhat similar to the fact that, every acre newly added to cultivation does not add to productivity to the same extent as the average acre of existing cultivation.* We have not succeeded in tracing the causes of the phenomenon sufficiently clearly to indicate what the future will be like in this respect. It is probable that consumption rates will not be found to be susceptible of reduction to the same extent in future as in the past. *Let us assume that so long as conditions of food shortage continue, the demand set up by every newly added consumer will be only one-half of the existing average rate of consumption.* On that assumption, our import norm will rise only by 4 lakhs tons per annum for some years to come even if no development took place. And if some development (which is significant though insufficient to keep pace with the growth of population) takes place, there will be so much less increase in the import norm.

43. We may clarify this conclusion by more precise statement as follows:

If D lakhs of ANNUAL tons is the development of agricultural productivity actually achieved between the year 1951 and the year $1951+N$; then we may assume (for the present as a working rule) that the import norm would rise to $34 + 4N - \frac{4D}{5}$ lakhs of tons per annum by the year $1951+N$. If we can keep up a bare minimum of development of agricultural productivity at the rate of 5 lakhs ANNUAL tons every year, we should just succeed in raising average production of foodgrains by 4 lakhs tons every year. This might probably be just sufficient to stabilise our import norm at the level already reached, and also keep supplies distributed without noticeable hardship or breakdown. *If, however, we do not keep up even this minimum rate of development of agricultural productivity and if at the same time we dismantle our 'state trading system' also, then we shall have lost control over supplies and prices of foodgrains and the drift towards eventual breakdown will have started. If, while this drift was proceeding, a world war should begin and external supplies get cut off—the*

* cf. Chapter IV, para 6c.

blow will have fallen. The people in all parts of the country must pass through the Valley of the Shadow as the people of Bengal did in 1943. That is an extreme contingency. If, however, we are able to secure imports which are not too far short of the norm indicated by the formula and if we keep up our state trading system and distribute available supplies equitably; without giving rise to panic, it should be possible to carry on for a long time without breakdown. In other words, it is not as if there are only two possibilities—complete success or total failure. The stalemate at present reached in our struggle with food shortage may continue for a long time.

44. It will be said that this is an excessively pessimistic appraisal of the future based on a wrong approach to the whole problem. The right approach, it will be said, is to base ourselves on the experience of other countries (notably Great Britain) which developed much greater dependence on imported food supplies when their population was expanding rapidly. These countries have not only not come to grief, they have raised the nutritional standard of their people. Why should we fail to do the same? The right answer to our problem, according to this view, is not to concentrate excessively on forcing the growth of agricultural productivity but to industrialize the country more rapidly, export more and more of our industrial products; and buy enough food from foreign countries to meet the needs of our growing numbers without stinting.

It is true that Great Britain developed in this way during the last century. It is equally true that the determination of certain other countries to develop in the same way created stresses and strains which led to two World Wars. It seems most unlikely that any other country with a larger and growing population will develop in that way hereafter. Great Britain was fortunate because she was first in the field and developed her industries and foreign trade at a time when the productivity of cultivation in the world as a whole was developing at a faster rate than the population of the world as a whole. It was then possible for productivity of cultivation to move so fast mainly because a whole New World was being opened up by modern transportation. Virgin land with fertile soil was plentiful and yielded an abundant return in relation to the effort and expense involved in bringing it under cultivation. We have seen in earlier chapters that there are a number of different indications all of which point to the fact that this was an exceptional phase of human history, and that anyone who regards it in the light of a recurring normal feature of human life has not got the correct perspective. During the last few decades the population of very large parts of the world has been growing faster than the productivity of its cultivation, and—over increasingly large areas—development is ceasing to come about 'naturally', it has to be forced. Food exporting countries tend to get fewer and

their exportable surpluses tend to become less abundant * Food importing countries tend to increase, as also the quantities they need to buy. In these circumstances, food importing countries should, in their own interests, limit their demands voluntarily, co-operate in buying available supplies at fair prices and sharing them equitably according to need. If instead of doing this, they adopt the policy mentioned above, viz., to force the exports of industrial products and rely on the purchasing power thus acquired in order to back steadily increasing demands for food, they would only succeed in injuring themselves. The supplies available for international distribution will remain much the same ; the price of food will go up and increasing quantities of industrial products will have to be sold in order to procure the same amount of food. Available supplies will be distributed unfairly and the industrially weakest will go to the wall, however urgent their need. These results are bound to follow unless the food exporting countries of the world increase agricultural productivity at a faster rate than their own rate of growth of population *and produce increasing surpluses to match increasing deficits in India and Europe.* This will not happen. It follows that industrialisation is not the answer to the food problem ; the widespread belief to the contrary is a fallacy, based on a misreading of history.

This does not mean that development of industry is unnecessary or unimportant. Far from it. But, we should be clear about why we need it. We need it, in order to provide ourselves with those goods and services which add to the comforts and conveniences of life and to make life and work less laborious. Industrialisation will not help to solve our food problem, except indirectly to a limited extent in so far as it can provide the materials needed for the development of agricultural productivity.

45 So then, we have reached two conclusions. One is : that we cannot grow as much food as we shall need, if we go on increasing in numbers as we do. The other is : that if we do not grow more food, we must eat less food.

What follows— that starvation is our lot ? No. It follows that we should make up our mind that we shall not go on increasing in numbers as we do. We should realise that it is unprovident on our part to permit ourselves to increase in numbers indefinitely without taking thought of how our children and our children's children are to live ; and we should resolve to put an end to this increase as soon as possible.

* Relevant data on this phenomena will be found in APPENDIX V. The position is unmistakable about rice. Though it is somewhat less difficult in recent years about wheat, the drift is in the same direction.

46. This is all very well. We may resolve on what we please. 'That is easy enough. But can this resolve be put into execution ? Is it possible to bring about a substantial reduction of the rate of growth of our numbers—let alone a complete stoppage of increase—sufficiently quickly to make a material difference to the prospect for 1981 (which is what we are considering) ?

The last section was devoted to an exposition of the implications of the effort to raise agricultural productivity at a fast enough rate so as to keep pace with the unchecked growth of population. The conclusion was reached that even with the best efforts we would probably succeed in increasing productivity only by about one-third of the present level ; whereas it is necessary that the increase should be in excess of one-half of the present level, if we are to succeed in 'keeping pace'. That was why we reached the conclusion that the effort to 'keep pace' with unchecked growth of population until 1981 was impracticable. How do we know that the effort to limit births and arrest the growth of population is any less impracticable ? That is the crucial question we have to answer. Before answering it, let us note and briefly dispose of a few other aspects of this highly contentious subject.

47. In recent years, the population problem is debated in almost all countries of the world and very varying views are held. *First*, there are those who hold that the practice of contraception is sinful. A sinful thing could not be necessary or desirable or other than harmful in every way. Therefore, they feel it their duty to prevent the spread of this practice. As, however, few people are now-a-days willing to accept prohibitions without explanation, they proceed to explain that the growth of population presents no problem at all or that the problem can be solved in many different ways which will not involve the use of contraception. It would be a mistake to under-estimate the force of this taboo. This force does not depend on the soundness of the reasons adduced in support of it, but on the respect which is justly due to religion generally, and to the opinion of all people who are manifestly sincere and disinterested. If we recall the fact that, only recently, the World Health Organisation felt compelled to avoid even considering this subject, we must count it a fortunate circumstance that the religious faith of most of our people is not bound up with this taboo. It is, therefore, easier for us—while affirming due respect for religion, morality and the integrity of family life—to insist that the question whether contraception is good or bad for the people shall be considered in the light of uninhibited reason.

48. *Secondly*, there are those who are quite convinced of the complete absence of any necessity for any effort to restrain the growth of population : the population may grow to any extent—it is always possible to organise their

activities in such a way as to produce the food and all other goods and services needed for an ever-rising standard of living for all of them. To them, it is unnecessary that there should be enough land; the secret of managing with less and less land *per capita* is simple—collectivize it! But how can we get the same amount of food from less and less land even if the land were to be collectivized? We are told that we may safely leave this to science. It is, it seems, an observed fact that those people who make full use of science develop technology at a faster rate than the growth of population. Collectivization of land *plus* technology means adequate food for all the people—no matter what the quantitative relation may be between the land and the people. That is the belief. It is not so much a belief in science as *scienolatry*. This new religion comes in handy for a school of thought, which is on principle, opposed to admitting that the shortage of land could be an operative cause of poverty at any time. For if it can be operative in future, it might be operative already. If this belief gains ground, it would weaken a political and economic doctrine which attributes the hardships of the poor exclusively to the wickedness of the less poor. And no opinion which has such an effect can be true. Most people, however, do not reason this out at all. They are concerned with the result—all people should get all the food they need. This is happening in other countries; and they are determined that it must happen in India also. Since science does seem to work wonders in so many other ways, why should it fail in this purpose? To such people, the answer must be: "Yes, you are right. But, if you believe in science, you must believe in it fully. Science has placed in your hands the means of reducing births, just as much as of reducing deaths or of increasing the yield of crops. You should use all of them equally well. You should not combine a scientific approach to agriculture, hygiene and medicine with an unscientific approach to contraception."

49 *Thirdly*, there are those who agree that the growth of population should be checked; but maintain that there is no need for the Government to mix themselves up too prominently in such a delicate and controversial matter. All that the Government need do, according to this view, is to concentrate on improving the standard of living of the people. When we attain West European standards of living we shall also have West European birth rates. Some say the reduction of the birth rate will come about by the people adopting contraception of their own accord in order to preserve their high standards of living. Others say that high standards of living (especially an adequate supply of protein food) will induce physiological changes which will bring about a reduction in the number of children born, even without the practice of contraception. Anyway, both schools agree that when the Government have solved the

problem, the people will see to it that the problem stays solved and does not reappear. That is, no doubt, comforting. But what is to happen if it is true that you cannot solve the problem unless you have checked the growth of population beforehand ?

50. That brings us back to the crucial question of practicability, still to be answered : Which is more difficult—checking the growth of population or keeping pace with the unchecked growth of population ? Obviously, the answer is bound up with the state of public opinion on the subject.

It was nearly 37 years ago when Shri P. K. WATTAL, the pioneer of Indian thought on this subject, published his luminous essay "*The Population Problem in India — a Census Study*". At that time he likened his effort to "the intrusions on the peace of mind of an occupied and self-satisfied public by faddists who put up their umbrellas and insist that it is raining when every good man of the world knows that the sun is shining". He judged the mood of the public aright.

Since then many able writers, scholars, scientists, economists and men of religion have carried on the debate—while the world and India were changing rapidly, and the problem grew and became visible to the naked eye. Within the last few years, public interest has grown enormously. There is widespread and continuous discussion in the press, the platform and among social workers. At the same time, the practice of contraception is beginning to take root among wide sections of the urban intelligentsia—the people who are hardest hit by recent economic changes.

This movement of public opinion has now acquired coherence, crystallisation and a sense of direction with the publication, by the Planning Commission, of its report on the First Five Year Plan.

51. The views expressed by the Planning Commission are extracted below :

"The recent increase in the population of India and the pressure exercised on the limited resources of the country have brought to the forefront the urgency of the problem of family planning and population control. The application of medical knowledge and social care has lowered the death-rate, while the birth-rate remains fairly constant. This has led to the rapid increase in the growth of population. While a lowering of the birth-rate may occur as a result of improvements in the standards of living, such improvements are not likely to materialise if there is a concurrent increase of population. It is, therefore, apparent that population control can be achieved only by the reduction of the birth-rate to the extent necessary to stabilise the population at a level consistent with the requirements of national economy. This can be secured only by the realisation of the need for family limitation on a wide scale by the people. The main appeal for family planning is based on considerations of the health and

welfare of the family. Family limitation or spacing of the children is necessary and desirable in order to secure better health for the mother and better care and upbringing of children. Measures directed to this end should, therefore, form part of the public health programme

"All progress in this field depends, first, on creating a sufficiently strong motivation in favour of family planning in the minds of the people and, next, on providing the necessary advice and service based on acceptable, efficient, harmless and economic methods. But these presuppose (1) intensive studies about the attitudes and motivations affecting family size and techniques and procedures for the education of the public on family planning, and (2) field experiments on different methods of family planning as well as medical and technical research

"A programme for family limitation and population control should :

- (a) obtain an accurate picture of the factors contributing to the rapid population increase in India,
- (b) discover suitable techniques of family planning and devise methods by which knowledge of these techniques can be widely disseminated ; and
- (c) make advice, on family planning, an integral part of the service of Government hospitals and public health agencies

"A sum of Rs 65 lakhs has been allocated by the Central Government in the Plan, to the Ministry of Health for a family planning programme.

"This programme includes .

- (1) The provision, in Government hospitals and health centres, of advice on methods of family planning for married persons who require such advice. Medical Officers working at hospitals and health centres like maternity and child welfare clinics should give advice to women regarding family planning when such advice is necessary for health reasons. If a doctor feels that a woman patient cannot undergo again the strain of pregnancy and parturition without danger to health, it is obviously the duty of the doctor to give such advice as is necessary to enable the person to prevent conception. In these circumstances, the doctor would be justified in suggesting any chemical, mechanical or biological methods of contraception or sterilization as may be indicated for the individual case. The giving of advice on birth control has been a procedure allowed by the Ministry of Health in U K. in medical centres maintained by the local authorities
- (2) Field experiments on different methods of family planning for the purpose of determining their suitability, acceptability and effectiveness in different sections of the population: If it can be demonstrated that our people, particularly those living in rural areas, can be educated to accept the rhythm method and use it as a practical method of limiting family growth, Governmental support should be extended to the propagation of this method. From the point of view of avoiding enormous

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expenditure as well as that of securing the ethical values that community life would gain by the self-imposed restraint which the rhythm method involves, it would seem desirable to try out this method fully and thus ascertain its practicability. Whether the rhythm method is capable of wide application in the community with adequate results or not, actual experimentation alone can tell. Research and experiments need not however be confined to a single method. There are numerous voluntary agencies which are currently propagating the spread of information on family planning and the use of chemical and mechanical contraceptives. Their activities would need support.

- (3) Development of suitable procedures to educate the people on family planning methods. Inexpensive means of rapidly educating the public in matters relating to family size will have to be evolved if large-scale reduction in the national birth-rate is to be obtained. Scientific techniques are available to assess the effect of mass educational campaigns. These techniques should be used to develop educational programmes suitable for the different economic and social sections of the population.
- (4) Collection, from representative sections of the population, of information on reproductive patterns, and on attitudes and motivations affecting the size of the family. The reproductive pattern in any population is largely determined by social and cultural factors which may differ from one area to another. A thorough investigation of the differences in attitudes and motivations towards family size and of the factors responsible for producing such differences is important. Research along these lines is necessary if we are to understand the particular sentiments and aspirations to which programmes of family limitation in various sections of the population should appeal.
- (5) Study of the inter-relationships between economic, social and population changes. The information obtained by such studies will form the necessary background for the formulation of a national population policy and the development of appropriate measures for population planning based on factual information.
- (6) Collecting and studying information about different methods of family planning (based on scientifically tested experience in India and abroad) and making such information available to professional workers.
- (7) Research into the physiological and medical aspects of human fertility and its control.

"It is considered that the problems of population and family planning may be divided into those relating to :

1. Policy and approach, and
2. Research and programmes.

CHAPTER V : THE PROSPECT—1981

Two committees have accordingly been constituted. It would also appear desirable to set up at a later date a population commission to assess the population problem, consider different views held on the subject of population control, appraise the results of experimental studies and recommend measures in the field of family planning to be adopted by the Government and the people."

52 That is as far as we have reached today in the evolution of public opinion about this highly contentious subject. Conflicting voices are still heard, but the ultimate outcome of the debate is no longer in much doubt. *People are coming to believe that population control is necessary and that it is unlikely to come about quickly enough unless Government took some steps to bring it about. That is a great advance.* But we are not yet sure how we are going to set about the task of inducing the people to limit births. It seems so visionary—almost unreal—when we think about the villages which are five-sixths of the problem. We are also not very clear in our mind how much time we have in this matter. Perhaps limitation of births is merely a desirable thing to be achieved in due time when it becomes practicable. Or is it something about which it is essential in the national interest that definite results of a measurable character should be achieved within a specified time? We do not know; we are not sure. We have not yet reached the point at which consideration of targets and priorities can be placed on the agenda. But we must look ahead—as far ahead as 1981—and consider targets and priorities. Otherwise, the efforts of Government will prove to be inadequate and half-hearted. The great advance already made in the evolution of public opinion may fail to take us anywhere.

53. Our appraisal of the possibilities of development of agricultural productivity has led us to the conclusion that it might be possible to achieve an overall increase of agricultural productivity by about one-third of its present level—and this would correspond to the needs of a total population strength of 45 crores. This may be reached sometime round about 1969. That would give us a maximum of about 15 years for planned measures to limit births, to become effective and yield results. It is not a very long period for such a large enterprise; but it cannot also be said to be far too short. Let us then define our general aim to be: *so to limit the number of births that they do not materially exceed the number of deaths and thus achieve a substantially stationary population before our number exceeds 45 crores.* That would be the first step towards a crystallisation of ideas on targets and priorities.

54 Though the objective as thus defined is clear enough, it will serve the purpose of indicating the needed practical measures much better, if it can

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be put in a form in which every one may perceive his or her own share of the collective obligation. It is in this context that the conception of 'improvident maternity', which was touched upon in an earlier chapter, acquires practical importance. The birth rate is something for which responsibility can be fastened on no one. But the number of births which occur to a married couple are, *ex hypothesi*, controllable by them. Is it possible to specify a maximum number of child-births which every married couple can have without creating a national problem regarding the future of their offspring. There are reasons to believe that this is possible; and that the number is three. *Let us, therefore, define 'improvident maternity' as a child-birth occurring to a mother who has already given birth to three or more children, of whom at least one is alive.* Let us also define the 'incidence of improvident maternity' as the figure obtained by expressing the number of births of this nature as a percentage of all births occurring in any particular area during any particular period of time. *A relatively simple calculation shows that if we can put an end to improvident maternity as thus defined, or at any rate reduce its incidence drastically, the excess of births over deaths will be reduced to negligible numbers and a substantially stationary population achieved.* As this conclusion is important, the relevant calculation should be explained.

55. It has been estimated that the incidence of improvident maternity is, at present, somewhere between 40 per cent and 45 per cent in our country. Out of every 40 births which occur among every 1,000 people in the course of one year, 17 births are of this nature. Suppose we succeed in inducing the people to avoid such births. Our national birth rate would then fall from 40 to 23. Our national death rate is at present 27. Out of the 27 deaths which occur among 1,000 people in the course of one year there are 11 children under 5 years of age, of whom 7 are infants who have not completed one year of age. A reduction in the number of births from 40 to 23 is likely, therefore, to be followed by a reduction of these 11 deaths to 6. In other words, avoidance of improvident maternity will not only reduce the national birth rate from 40 to 23* but it will also reduce the national death rate from 27 to 22 at the same time. The net result will be to reduce the rate of growth of population from about 13 per cent per decade to about one per cent per decade. If improvident maternity is not

doubt likely that further diminution of the death rate might be expected to occur as a result of general improvement of health standards. We may confidently expect this to be offset by further diminution of the birth rate. This will happen because the people who have got rid of improvident maternity will, *ex hypothesi*, have acquired effective control over child-bearing. It will then be easy and natural for them to pass over from avoidance of 'improvidence' to positive 'prudence'. An increasingly large proportion of mothers will limit themselves, of their own accord, to two children without being urged to do so. Thus the fall in the birth rate may be expected to keep pace with the fall in the death rate.

56 Let us, therefore, define our objective, not in the general terms already mentioned in paragraph 53, but specifically in relation to improvident maternity. The task before the nation is first of all to bring about such a change in the climate of public opinion that every married couple will accept it as their duty (to themselves, to their family, and to that larger family—the nation) that they should avoid improvident maternity. The occurrence of improvident maternity should evoke social disapproval, as any other form of anti-social self-indulgence. This is necessary, but not enough. There should be standing arrangements for ensuring that advice is given to every married couple on the various ways open to them for discharging this duty and to make available the necessary facilities. In order to regulate the scale and tempo of planned measures designed to achieve this purpose, the following target should be fixed: *The incidence of improvident maternity should be reduced from its present level of over 40 per cent to under 5 per cent within 15 years.*

57. It will be noted that we are moving beyond the general statement that it is desirable for mothers to limit the total number of births, to space births, and so on. Approaching the subject from the point of view of national necessity, a single common limit is suggested for all. Consistently with this approach it is immaterial if, in a particular case, the pecuniary circumstances of the family or the state of health of the mother are such that further maternity may be allowed to occur and the offspring supported without much difficulty. Whether or not the individual can afford it, the nation cannot—and hence it is 'improvident maternity' all the same. While this must be made clear beyond doubt, it is also necessary to point out that there is, in fact, no conflict in this matter between the interests of the individual, of the family, and of the nation as a whole. No elaborate argument is necessary in order to show that if improvident maternity were universally avoided, no one will be unhappy or worse off. On the other hand, mothers will live longer, healthier and happier lives, and children will

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be better fed, better looked after, and acquire an altogether better start in life. There will be an enormous reduction in the numbers of infants who die within a year of their birth. If we can convert ourselves to the view that improvident maternity is a form of anti-social self-indulgence which all of us should avoid—and if we can equip ourselves with the knowledge and the material means of avoiding it—we shall have done more to reduce human suffering and promote human happiness than by all other measures of economic and social planning combined.

58. Let us suppose that the target for reduction of improvident maternity is accepted; and consider how to set about the task of attaining it.

To begin with, we should be careful not to rush into the streets with trumpets and drums in order to preach the new faith and count the converts. There will be need for something of that kind—but in due time. The first phase of the programme of measures must be devoted to thorough preparation. Out of the total of 15 years which are available to us for the attainment of the target, the first phase would need at least three years from the word “GO”. It may take as long as five years. The preparation should consist of two sets of measures, of which one may be described as the creation of organisation and the other as the standardisation of technique. Both are equally important; they should proceed, side by side.

59. What sort of organisation shall we need? It is clear that it must command the services of a sufficient number of workers, distributed over the whole country, in such a way that they will have friendly personal access to all mothers in the country, and effective opportunity to assist and advise them. No such organisation exists at present. Nor can one be created, whose function is limited solely to the dissemination of birth control appliances and advice.

This function must, therefore, be performed as a subsidiary activity of an organisation whose main function would embrace the whole field of maternity and child welfare.

births until we have completed our development programme in other respects. No. It is unnecessary to wait for the completion of the agricultural, industrial, or other economic development programmes. It is not even necessary to wait for the development of a full-fledged National Health Service. *But it is necessary to isolate that part of our health programme which relates to the provision of maternity and child welfare services ; give it top priority (along with, say, irrigation and ahead of all other development) and undertake accelerated development of these services to the point at which the needed organisation is created.*

60 How long will this take ? Will it not be held up like many other health and education schemes by lack of trained personnel Obviously, the services of trained personnel will be needed—qualified midwives will be essential. But the problem would be a manageable one if care is taken to locate, and fully utilise, the services of all the 'dais' who are to be found in all parts of the country—practising midwifery in its traditional form It is possible, even probable, that these humble women hold the key to the solution of the population problem They should be given simple training and instruction, advised and assisted by duly qualified midwives and helped to perform their useful services better than they do at present. Those who render satisfactory service should be encouraged by payment of a modest bonus, to supplement their professional earnings. They should then be required, in return, to function in the villages as the agents of the maternity and child welfare centres If this is done and the number of duly qualified midwives is increased rapidly and substantially, the staff requirements should be met. It is true that higher supervisory staff might be scarce for a long time, but the shortage can be largely made good by making the fullest use of the services of public-spirited social workers. This is, in any case, necessary in order to develop the usefulness of the services as quickly as possible. All social workers who are willing to help should be effectively organised (at the local level, the state level and the national level) and firmly linked with appropriate governmental agencies at all three levels. Given the necessary determination and drive, as well as the funds, the personnel needed for the work can be got together—at any rate over the greater part of the country—within five years.

61. This will complete one part and, no doubt, the more difficult part of the preparation which is necessary before a nation-wide campaign for reduction of improvident maternity can be launched The second part is the one already visualised by the Planning Commission and provided for in the current Five Year Plan A Central Research and Information Unit should be set up, in order to carry out the various items of work described by the Planning Commission.

In one sense, the activities of the Unit will have to be continued for an indefinite period—for there is scope for a great deal of research. But certain tasks should be laid down as required to be completed within a specified time.

- (i) The Central Research and Information Unit should be required to recommend a few *acceptable, efficient, harmless and economic methods* which are suitable for being sponsored by Government. It is perfectly obvious that no one contraceptive appliance is likely to fulfil all the criteria equally well. Therefore, harmlessness alone should be the decisive test; and cheapness the second most important consideration. One at least, among the recommended methods, should be based entirely on very cheap materials readily available in all parts of the country, even if the appliance is not entirely efficient or acceptable to all people.
- (ii) This does not mean that methods of avoidance of undesired births other than those involving the use of contraceptive appliances are to be ignored. On the contrary, they have an important part to play in achieving the national purpose, and it should be the duty of the Central Research and Information Unit to formulate correct ideas and guidance on the subject :
 - (a) The so called 'rhythm method' has received considerable publicity recently. There is much difference of opinion about a somewhat complicated version of this method, which is under investigation. There is also a simpler version, according to which people are merely advised to *abstain from conjugal relations during the middle-third of every menstrual cycle*. It is not asserted that those who follow this simple rule of what may be called 'conjugal temperance' can be *certain* that conception will be avoided thereby. It is freely conceded that the 'safe period' is a misnomer and might not always be safe. But it is claimed that the observance of this simple rule is calculated (in many cases though not all) to reduce the chances of conception very substantially. If a large proportion of people living in a locality observe the rule, it would be reflected in a material diminution of the birth rate of that locality. Such a method will obviously be of no use to persons to whom certainty of avoidance of pregnancy is essential on grounds of health. It is also useless to persons who have had three or more children already (in the context of national policy envisaging the abolition of improvident maternity). But, if the claim is verified to be correct, it may be very useful for married couples to practise 'conjugal temperance' during the first decade

or so of married life before they have had three children. It should be the duty of the Central Research and Information Unit to formulate clear guidance on this matter.

- (b) Another non-appliance method of contraception which requires consideration is '*coitus interruptus*'. There is, at present, practical unanimity (of a somewhat disconcerting nature) about this subject among social workers engaged in the popularisation of birth control. They dismiss it with a brief reference to neurasthenia. Doubts about the wisdom of this attitude arise when one studies the report on an "investigation carried out by the Council of the Royal College of Obstetricians and Gynaecologists into family limitation and its influence on human fertility during the past five years". A few extracts will be found in APPENDIX VII. The statistics collected during this investigation prove that "among a group of couples married in 1935-39, all of whom had practised some form of birth control between marriage and 1946, as many as 44 per cent had never employed any kind of appliance contraceptives". Forty-four per cent is a very large proportion, and they do not seem to have done so badly. The finding is that "pregnancy rates during the practice of 'non-appliance' birth control were found to be about one-fifth higher than under appliance methods". Other figures show that the proportion of people who successfully limit their families in this way used to be still higher in the past. The Commission finds that this is not due to ignorance of the existence of more effective methods or a mere prejudice against their use. "It must not be assumed", the Commission reports, "that in the present state of birth control technique there may not be a considerable number of people who positively prefer non-appliance methods". Now, it is impossible to believe that people would practise this method in such large numbers over a long time if it was invariably calculated to make them nervous wrecks. There are, no doubt, circumstances in which harmful results would follow. But equally clearly there must be circumstances in which they would not, otherwise the facts found by the Commission could not exist. There is, at present, a complete absence of serious information on the subject. It is necessary that correct information should be collected on this point. *It is possible—to put it no higher—*

*It is made clear in the report that 'non-appliance methods' are to all intents and purposes synonym for *coitus interruptus* in the United Kingdom.

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that a large proportion of people who are unable or unwilling to use appliance methods of contraception for one reason or other, might yet succeed in avoiding improvident maternity by the practice of 'conjugal temperance' until three children are born and 'coitus interruptus' thereafter. If this possibility can be confirmed by the Central Research and Information Unit, after careful study, the resulting social gain would be enormous.

- (c) Apart from methods developed in foreign countries, it is possible that there are also some indigenous methods of a traditional nature, which are reasonably effective. There are references in old census reports to the belief that the tea garden coolies of Assam have long practised some effective method of contraception. This may or may not be the case now, but an effort should be made to locate indigenous methods which may be locally well-known but not generally talked about.
- (d) There is a good deal of ignorance over the whole subject of conjugal relations. This is due, as the Royal Commission observes, "to the furtive air that clings to the subject. Despite the efforts of organisations and individuals, through books and pamphlets and other educational means, to impart contraceptive knowledge in a healthy context, many persons still acquire the information only through dealers in pornography and from furtive talks" It should be the duty of the Central Research and Information Unit to cleanse the atmosphere and let in fresh air.
- (iii) Apart from appliance methods and non-appliance methods of contraception, there is the method of sterilisation— especially of the male. The technique is believed to be making good progress in recent years. The claim is made that the minor operation involved is safe, effective and free from any disabling effect both from the point of view of general health and the continuance of normal conjugal relations. If this is true and is brought home to the people, sterilisation of the male may become an important part of the methods by which improvident maternity is avoided. It is understood that the rapid expansion of facilities needed for meeting a rapidly growing demand will not present any formidable difficulty. Provision of authoritative guidance on this subject will be very valuable *

*Paragraph 61 deals with voluntary resort to sterilisation by people who wish to avoid improvident maternity. It has nothing to do with the proposal that people suffering from certain types of diseases should be compulsarily sterilised—a very different matter.

62. While these preparations regarding organisation and standardisation of methods are proceeding, those agencies which are already working in this field (mainly in cities) should be actively encouraged and assisted to develop their activities. Experience and information which become available thereby should be fully utilised by the Central Research and Information Unit. When the preparations are completed and the responsible authorities are satisfied that they are ready, the second phase should commence. A nation-wide campaign should be launched for the elimination of improvident maternity from the life of the people. The campaign should be explained to the people in villages, as well as towns as a national movement designed to achieve a social reform indispensable for assuring the safety of the nation and promoting the welfare of its mothers and children. It will be essential for the success of this campaign that it should be launched and directed by a national organisation of women social workers, which should have actively helped earlier in the development of maternity and child welfare services. The educative campaign should receive political backing at the highest level. The elected representatives of the people who are members of Village *Panchayats*, Municipal Councils and District Boards should personally take active interest in the progress of the campaign in their areas.

Once the mind of the people has been won, the rest will be easy. The recommended practices will spread, and the advice and facilities provided by the maternity and child welfare centres will be readily utilised. Progress achieved from year to year can be precisely measured by the statistics of registration of births and deaths—which will become complete and accurate as a result of the working of these services. The Central Government and Parliament, the State Government and the State Legislature, Municipal Councils, District Boards and *Panchayats*—all of them could review once every year at what rate the incidence of improvident maternity was actually following among the people committed to their charge. On the basis of such review they can take special steps to stimulate effort in areas which were lagging behind. If we set about the work in this way, we shall be able to secure—in about 15 years—that *India has the lowest incidence of improvident maternity among all the countries of the world*. Why should we imagine that something which is demonstrably good for mothers and children—and which the western peoples have adopted without any help or encouragement from the State—would be rejected by our people, even when they are helped and encouraged by the State?

63. Obviously, all this will cost money. How much money will be needed? We cannot be sure about this, until we are nearing the end of the preparatory

phase of the whole programme. But some idea, however tentative, is necessary at least in order to get a dimensional picture. The subject was discussed in this light by the present writer with Dr. T. LAKSHMINARAYANA, the Adviser of the Planning Commission on Health Programmes. A tentative estimate drawn up by him is included among the papers printed as APPENDIX VII.

His conclusion is that the expenditure chargeable to public funds will be approximately half-a-rupee per head of population, as the cost of providing maternity and child welfare services in the manner described. This will be the annual recurring expenditure required when the services are fully developed, the expenditure will be smaller during the preparatory phase when the services are being built up.

For a poor country with a large and growing population, half-a-rupee per head is not a small sum; it is quite a lot of money. We have to face the fact. We must consider the problem on the basis that the growth of population cannot be checked unless there are maternity and child welfare services; and we cannot have such services unless we find the money for it. If the cost is fairly shared between the Central Government, the State Government and the local body concerned, it should not press unduly heavily on any of them.

64. We may now hark back to paragraph 46, where the crucial question was formulated: If the effort to develop agricultural productivity with such rapidity as to overcome present shortages and keep pace with unchecked growth of population until 1981 is impracticable, is the effort to limit births and arrest the growth of population any less impracticable? The answer, it is now suggested, is in the affirmative. It would be idle, in any case, to maintain that there is any solution for our population-land-food problem which does not call for difficult, costly and sustained effort over an extended period of a type for which no precedent exists in history. We have already embarked on such effort. What we have now got to do is to take stock of the *entire* problem, and not merely the reflection of it over the limited period covered by one Five Year Plan or two. We should take a long-term decision envisaging the complete solution of the problem. If we find, on a long-term view, that more than one course is open to us, we should choose the one which is less difficult, less costly and more likely to solve the problem permanently.

The general tenor of the conclusion to which we are led by the analysis made in this chapter may be stated as below:

The effort to overcome present shortages and keep pace with unchecked growth of population until 1981 involves the development of agricultural productivity by 380 lakhs of ANNUAL tons.

If the effort to develop agricultural productivity is combined with a simultaneous effort to reduce the incidence of improvident maternity to about five per cent, it will be sufficient to limit the development of agricultural productivity to 240 lakhs of ANNUAL tons.

The former is unlikely to cost less than the latter or prove to be more practicable. The latter offers a permanent solution of the problem, while the former does not. The former opens up a prospect of indefinite duration of hard labour without immediate results. The latter will be rewarded by visible reduction of human suffering and promotion of human happiness while the effort is still proceeding. The choice is clear.

D — Conclusion

WE HAVE COME to the end of our attempt to project our mind some way into the future and visualise the prospect for 1981. We have seen clearly the drift of the current on which we have been moving since 1921 and whither it was taking us. We have taken note of the efforts now being made to steer the ship of State in an altogether different direction and studied the chart of this new course—the First Five Year Plan. Let us summarise the broad conclusion—

First,— If we can be sure that food will be available to the people during the next thirty years, at least as well as it has been during the last thirty years, and if no popular movement in favour of limiting births develops (as it has done among Western peoples), then the further course of population growth may be foreseen with confidence. Our number will grow from about 36 crores in 1951, to about 41 crores in 1961, 46 crores in 1971 and 52 crores in 1981.

The growth will, indeed, be somewhat more rapid as (in the conditions assumed) the expectation of life will continue to increase.

Secondly,— The likelihood of the last figures being actually reached is, however, small. The governing assumption—continued availability of food supply at undiminished rates of consumption along with unchecked growth of population—is unlikely to hold good for as long as thirty years.

CONCLUSION

This conclusion is reached after taking full account of the technological possibilities of development of agricultural productivity.

Thirdly.—The experience of 1943 gives warning of the possibility that growing food shortage might lead to a breakdown of the distribution of food supply and thus open the way to a return of those 'natural' checks to population growth which were in operation during the thirty years preceding 1921.

This possibility, however, is unlikely to be permitted to materialise. The system of planned 'state trading' in foodgrains, developed during the last decade, is now well-established. So long as we hold fast to it, there is a guarantee that food shortage will be kept under control and prevented from developing into a breakdown of food supply. Sufficient time will, therefore, be available for wise planning and efficient execution of measures designed to overcome food shortage permanently.

Fourthly.—It is possible to overcome food shortage permanently, by taking suitable measures over an extended period of about fifteen years.

For this purpose, development of agricultural productivity on an even larger scale than that undertaken in the First Five Year Plan will be necessary, but it will not be sufficient. Effective steps should be taken concurrently to limit births to approximate parity with deaths and thereby achieve a substantially stationary population.

Fifthly.—Births will get limited to approximate parity with deaths, if what has been described as 'improvident maternity' is avoided by all or most married couples. ['Improvident maternity' consists of all births occurring to mothers who have already had three or more children, when at least one of them is alive.]

Sixthly.—A combined approach to the solution of our problem calls for the following targets:

- (i) Increase of agricultural productivity from the present level of approximately 700 lakhs of ANNUAL tons to about 940 lakhs of ANNUAL tons
- (ii) Reduction of improvident maternity from over 40 per cent (its incidence at present) to under 5 per cent

If these two targets are accorded equal priority and ranked higher than all other development targets, they can be attained before population increases beyond 45 crores—our total number will then become substantially stationary round about 45 crores, and

Seventhly,— The attainment of the target of reduction of improvident maternity will necessitate the prior creation and permanent maintenance of a nation-wide organisation of maternity and child welfare services.

This is difficult, but feasible and essential.

66 This report began with a citation from the CONSTITUTION OF INDIA. It is appropriate that it should end with another.

The CONSTITUTION enjoins that the

"State shall regard the raising of the level of nutrition and the standard of living of its people and the improvement of public health as among its primary duties"

and that it shall

"direct its policy towards securing that the citizens, men and women equally, have the right to an adequate means of livelihood".

Who are the STATE ? They are

"the Government and Parliament of India, the Government and the Legislature of each of the States, and all local or other authorities within the territory of India or under the control of the Government of India".

This report, being a review of the life and livelihood of the people, has been written with the conscious aim that it should be of practical assistance to the STATE in the execution of this mandate of the people. It is humbly submitted accordingly, for the consideration of the STATE.

Natural Regions, Sub-Regions and Divisions

1. HIMALAYAN REGION

1 1 *Western Himalayan Sub-Region—*

- 1 11 Himalayan Uttar Pradesh division
- 1 12 Himachal Pradesh and Bilaspur division
- 1 13 Himalayan Punjab division
- 1 14 Jammu and Kashmir division

1 2 *Eastern Himalayan Sub-Region—*

- 1 21 Assam Plains division
- 1 22 Assam Hills division
- 1 23 Manipur division
- 1 24 Tripura division
- 1 25 Himalayan West Bengal division
- 1 26 Sikkim division

2. NORTHERN PLAINS REGION

2 1 *Lower Gangetic Plains Sub-Region—*

- 2 11 West Bengal Plains division
- 2 12 North Bihar Plain division
- 2 13 South Bihar Plain division
- 2 14 East Uttar Pradesh Plain division

2 2 *Upper Gangetic Plains Sub-Region—*

- 2 21 Central Uttar Pradesh Plain division
- 2 22 West Uttar Pradesh Plain division

2 3 *Trans-Gangetic Plains Sub-Region—*

- 2 31 Punjab Plain division
- 2 32 Patiala & East Punjab States Union division
- 2 33 Delhi division
- 2 34 East Rajasthan Plain division
- 2 35 Madhya Bharat Lowland division
- 2 36 Ajmer division

2 4 *The Desert Sub-Region—*

- 2 41 Rajasthan Dry Area division

3. PENINSULAR HILLS AND PLATEAU REGION

3 1 *North-West Hills Sub-Region—*

- 3 11 Rajasthan Hills division
- 3 12 Rajasthan Plateau division
- 3 13 Madhya Bharat Plateau division
- 3 14 Madhya Bharat Hills division

3 2 *North Central Hills and Plateau Sub-Region—*

- 3 21 Uttar Pradesh Hills and Plateau division
- 3 22 Vindhya Pradesh division
- 3 23 Bhopal division
- 3 24 North-West Madhya Pradesh division

3 3 *North-East Plateau Sub-Region—*

- 3 31 Chhota Nagpur division
- 3 32 East Madhya Pradesh division
- 3 33 Orissa Inland division

3 4 *North Deccan Sub-Region—*

- 3 41 South-West Madhya Pradesh division
- 3 42 North Hyderabad division
- 3 43 Bombay Deccan Northern division

3 5 *South Deccan Sub-Region—*

- 3 51 South Hyderabad division
- 3 52 Bombay Deccan Southern division
- 3 53 Mysore division
- 3 54 Madras Deccan division

4. WESTERN GHATS AND COASTAL REGION

4 1 *Gujarat-Kathwar Sub-Region—*

- 4 11 Bombay-Gujarat division
- 4 12 Saurashtra division
- 4 13 Kutch division

4 2 *Molabar-Konkan Sub-Region—*

- 4 21 Greater Bombay division
- 4 22 Bombay-Konkan division
- 4 23 West Madras division
- 4 24 Travancore-Cochin division
- 4 25 Coorg division

5. EASTERN GHATS AND COASTAL REGION

5 1 *North Madras and Orissa Coastal Sub-Region—*

- 5 11 Orissa Coastal division
- 5 12 North Madras division

5 2 *South Madras Sub-Region—*

- 5 21 South Madras division

Population Zones, States, Natural Divisions and Districts

Zone/State/Natural division (with code number)

Districts included

North India

UTTAR PRADESH

- | | |
|---|--|
| 1 11 Himalayan Uttar Pradesh division | Garhwal, Tehri-Garhwal, Nainital, Almora, Dehra Dun |
| 2 14 East Uttar Pradesh Plain division | Gorakhpur, Basti, Gonda, Behranch, Deoria, Banaras, Jaunpur, Ghazipur, Ballia, Azamgarh |
| 2 21 Central Uttar Pradesh Plain division | Kanpur, Fatehpur, Allahabad, Lucknow, Unao, Rai-Bareilly, Sitapur, Hardoi, Fyzabad, Sultanpur, Pratapgarh, Bara Banki |
| 2 22 West Uttar Pradesh Plain division | Saharanpur, Bareilly, Bijnor, Pilibhit, Rampur, Khair-ter, Muzaffarnagar, Meerut, Bulandshahr, Aligarh, Mathura, Agra, Mainpuri, Etah, Budaut, Moradabad, Shahjahanpur, Etawah, Farukhabad |
| 3 21 Uttar Pradesh Hills & Plateau division | Jhansi, Jalaun, Hamirpur, Banda, Mirzapur |

East India

BIHAR

- | | |
|---------------------------------|--|
| 2 12 North Bihar Plain division | Saran, Champaran, Muzaffarpur, Darbhanga, Purnea, Saharsa, Monghyr North |
| 2 13 South Bihar Plain division | Patna, Gaya, Shahabad, Bhagalpur, Monghyr South |
| 3 31 Chhota Nagpur division | Hazaribagh, Ranchi, Dhanbad, Palamau, Singhbhum, Manbhum, Santhal Parganas |

ORISSA

- | | |
|------------------------------|--|
| 3 33 Orissa Inland division | Mayurbhanj, Keonjhar, Dhenkanal, Sundergarh, Phulbani, Ganjam Plain, Sambalpur, Bolangir, Kalahandi, Koraput |
| 5 11 Orissa Coastal division | Balasore, Cuttack, Puri, Ganjam Agency. |

WEST BENGAL

- | | |
|-------------------------------------|---|
| 1 25 Himalayan West Bengal division | Darjeeling, Jalpaiguri, Cooch-Behar |
| 2 11 West Bengal Plain division | Hooghly, Howrah, 24 Parganas, Calcutta, Burdwan, Birbhum, Bankura, Midnapur, Nadia, Murshidabad, Malda, West Dinajpur |

Chandernagore Chandernagore

ASSAM

- | | |
|----------------------------|--|
| 1 21 Assam Plains division | Cachar, Goalpara, Kamrup, Darrang, Nowgong, Sibsagar, Lakhimpur |
| 1 22 Assam Hills division | United Khasi and Jaintia Hills, Naga Hills, Lushai Hills, Garo Hills, United Mikir and North Cachar Hills, Mishmi Hills, Ahom Hills, Tirap Frontier Tract, Bihara Frontier Tract |

MANIPUR

- | | |
|-----------------------|---------|
| 1-23 Manipur division | Manipur |
|-----------------------|---------|

Zone/State/Natural division (with code number)

Districts included

TRIPURA

1 24 Tripura division . . . Tripura

SIKKIM

1 26 Sikkim division . . . Sikkim

South India

MADRAS

3 54 Madras Deccan division	Bellary, Anantapur, Cuddapah, Kurnool
4 23 West Madras division .	Melabar, South Kanara, Nilgiris
5 12 North Madras division .	SriLakulam, Visakhapatnam, East Godavari, West Godavari, Krishna, Guntur, Nellore.
5 21 South Madras division	Chittoor, North Arcot, Salem, Coimbatore, Tiruchirappalli, Madurai, Chingleput, Madras, South Arcot, Tanjore, Ramanathapuram, Tirunelveli

MYSORE

3 53 Mysore division .	Bangalore, Kolar, Tumkur, Mysore, Mandya, Chitaldrug, Hossan, Chickmagalur, Shimoga.
------------------------	--

TRAVANCORE-COCHIN

4 24 Travancore-Cochin division .	Trivandrum, Quilon, Kottayam, Trichur.
-----------------------------------	--

COORG

4 25 Coorg division . . .	Coorg
---------------------------	-------

West India

BOMBAY

3 43 Bombay Deccan Northern division	West Khandesh, East Khandesh, Dangs, Nasik, Ahmednagar, Poona, Satara North, Satara South, Kolhapur, Sholapur
3 52 Bombay Deccan Southern division	Belgaum, Bijapur, Dharwar
4 11 Bombay-Gujarat division	Banaskantha, Sabarkantha, Mahsana, Ahmedabad, Kaira, Panch Mahals, Baroda, Broach, Surat, Amreli
4 21 Greater Bombay division	Greater Bombay
4 22 Bombay Konkan division	Thana, Kolaba, Ratnagiri, Kanara

SAURASHTRA

4 12 Saurashtra division	Habar, Central Saurashtra, Zala-wad, Gohilwad, Sorath
--------------------------	---

KUTCH

4 13 Kutch division	Kutch
---------------------	-------

Central India

MADHYA PRADESH

3 24 North-West Madhya Pradesh division	Mandla, Sagar, Jabalpur, Hoshangabad, Nirmar, Betul, Chhindwara
3 32 East Madhya Pradesh division	Balrath, Bilundra, Chanda, Raipur, Bilaspur, Durg, Bastar, Raigarh, Surgua
3 41 South-West Madhya Pradesh division	Amraoti, Buldana, Alota, Yectmal, Wardla, N. T. . .

Zone/State/Natural division (with code number)

Districts included

MADHYA BHARAT

2 35 Madhya Bharat Lowland division

Bhind, Gird, Morena.

3 13 Madhya Bharat Plateau division

Shivpuri, Guna, Mandasaur, Raigarh, Shajapur, Ujjain, Ratlam, Bhisra, Indore, Dewas

3 14 Madhya Bharat Hills division

Dhar, Jabua, Nimar

HYDERABAD

3 42 North Hyderabad division

Aurangabad, Parbhani, Nanded, Bidar, Bhur, Osmanabad

3 51 South Hyderabad division

Hyderabad, Mahbubnagar, Raichur, Gulbarga, Adilabad, Nizamabad, Medak, Karim Nagar, Warangal, Nalgonda

BHOPAL

3 23 Bhopal division

Sehore, Raisen

VINDHYA PRADESH

3 22 Vindhya Pradesh division

Sidhi, Rewa, Satna, Shahdol, Datia, Chhatrapur, Tikamgarh, Panna

North-West India

RAJASTHAN

2 34 East Rajasthan Plain division

Jipur, Tonk, Sawai Madhopur, Bharatpur, Alwar, Sikar, Bhilwara, Jhunjhunu

2 41 Rajasthan Dry Area division

Ganganagar, Bikaner, Churu, Jodhpur, Barmer, Jalore, Pali, Nagore, Jaisalmer.

3 11 Rajasthan Hills division

Udaipur, Dungarpur, Banswara, Sirohi

3 12 Rajasthan Plateau division

Chittorgarh, Kotah, Bundi, Jhalawar.

PUNJAB

1 13 Himalayan Punjab Division

Kangra, Simla

2 31 Punjab Plain division

Ambala, Gurdaspur, Hoshiarpur, Amritsar, Jullundur, Ludhiana, Ferozepur, Karnal, Hussar, Rohtak, Gurgaon

PATIALA & EAST PUNJAB STATES UNION

2 31 Patiala & East Punjab States Union division

Patiala, Barnala, Bhatinda, Mohindergarh, Kapurthala, Sangrur, Kohistan, Fatehgarh Sahib

JAMMU & KASHMIR

1 14 Jammu & Kashmir division

Jammu, Kathua, Udhampur, Reasi, Mirpur, Chenani, Jager, Poonch, Jager, Baramulla, Anant Nag, Muzaffarabad, Ladakh, Astor, Gilgit (Leased Area), Gilgit (Agency)

AJMER

2 36 Ajmer division

Ajmer

DELHI

2 33 Delhi division

Delhi

HIMACHAL PRADESH AND BILASPUR

1 12 Himachal Pradesh and Bilaspur division

Chamba, Mandi, Sirmoor, Mahasu and Bilaspur

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CENSUS OF INDIA, 1951

VOLUME I

I N D I A

PART I - B — APPENDICES TO THE
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R. A. GOPALASWAMI,

OF THE INDIAN CIVIL SERVICE,

Registrar General, India and ex-officio Census Commissioner for India

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APPENDIX I

Population and Land Use

Introductory Note

Section I — Prefatory Remarks

1. GENERAL OBJECTIVE

THE objective of this series of tables is to bring out the relationship between population and natural resources in general and cultivation in particular, in India and its various zones and natural divisions. The data presented in the tables include physical factors like topography and climate, mineral resources, land utilization, cropping patterns and crop yields, and trends in cultivation. The relationship between population and cultivation has been brought out in special detail. Differences in cultivation *per capita* in different parts of the country have been shown, as also trends in population growth, cultivation and cultivation *per capita* for the last several decades. Finally, selected data on population, cultivation, crop yields etc., in U S A, Great Britain, the U S S R and other countries have been presented in order to afford a comparison of trends in India with those in other countries.

2. HISTORICAL ANALYSIS

A word needs to be said about the historical analysis of population growth and cultivation (TABLES I 5 to I 8). This analysis has been divided into two parts, depending upon the availability of reliable and comparable data. In the first part which deals with the period 1921-51, trends in population growth and cultivation have been shown for a large number of natural divisions. The second part deals with the sixty-year period, 1891-1951. For this part, the area coverage is much smaller—8 natural divisions in full, and parts of 5 natural divisions—because comparable and reliable data were available for only these areas. Due to various factors like changes in boundaries of districts and states and extension of non-reporting into reporting

areas, comparable data for such a long period were not available for a large part of the country. Only those areas were taken for this analysis in which such changes were either non-existent or were very small, and where the statistics were of a sufficient degree of reliability throughout the period to warrant long-term comparison. A scrutiny of all available data showed that only 8 divisions and parts of 5 divisions satisfied these requirements. These are, however, located in different parts of the country. In spite, therefore, of the limited area coverage a good cross-section of the country is obtained.

This historical analysis brings out the sharply contradictory character of the trends of change before and since 1921. Prior to 1921, growth of population and cultivation were nearly in balance. Population increase was fitful and slow, and increase in cultivation managed to keep pace with it. After 1921, however, population growth has been rapid and uninterrupted, while increase in cultivation, even where it has occurred, has been small and proportionately much less than the increase in population. Therefore, cultivation *per capita* had maintained substantially the same level upto 1921. Since 1921, it has been steadily falling everywhere.

That cultivation has been failing to keep pace with the growth of population is generally known and is almost a truism. It is not generally known (and it is, therefore, very important to appreciate) that this failure can be dated. The historical analysis is especially important because it establishes this fact and provides quantitative measurement of the decline of cultivation *per capita* since it started.

3 COMPILATION AND PRESENTATION OF DATA

The data for these tables have been compiled from published official statistics wherever these were available. These statistics were checked by the department concerned, and special efforts were made to (1) make adjustments for changes in administrative boundaries, (2) fill the gaps in statistical coverage, and (3) compile the statistics (which are generally available for districts and states) for natural divisions and sub-regions. In certain cases, where the data did not exist in the desired form, special compilations have been made by the department concerned. Thus, data on topography, i.e., area of mountains, hills, plateaus and plains (TABLE 10) was specially compiled by the Survey of India. Details of the manner of collection and processing of data for each table are given in Section III.

4 SCHEME OF NATURAL REGIONS, SUB-REGIONS AND DIVISIONS

It has been customary in past Censuses to compile subsidiary tables and to review Census data not only for the political and administrative units of the country but also for the territorial units which were deemed to be 'natural'. This arrangement was discontinued in All-India

Reports after 1911, though it was continued in the Census Reports of the old provinces and states. At this Census, it was decided that the system should be revived for purposes of the all-India review also. As, however, immense territorial changes had occurred since 1911, a completely new scheme of classification of the territory with reference to the physical conditions was worked out. The country has been divided into five natural 'regions' with reference primarily to topographical features. Each of the natural regions is divided into 'sub-regions' with reference primarily to rainfall and climatic conditions and also differences in soil so far as these are broadly identifiable and are reflected in the cropping pattern. The 15 sub-regions are further sub-divided into 52 'natural divisions'. The intersection of these sub-regions with the states forms the basis on which natural divisions are formed.

In addition to the threefold division of the country according to natural conditions, the states have also been grouped, for purposes of convenience of review, into six population 'zones'.

Details regarding the composition of natural regions, sub-regions, divisions and the zones are given in Census of India Paper No. 2 of 1952 and also at the end of Part I-A—Report.

Section II — Collection, scrutiny and collation of data

5 At the population censuses the total population of the country was ascertained and data on the various characteristics of the population, e.g., sex, age, civil condition, economic status, means of livelihood, literacy etc., were collected and tabulated and the results were published in the census tables. Along with these tables narrative reports of the Census Superintendents and the Census Commissioner for India, which reviewed the data collected at each census, were also published. The reports of the Census Superintendents and the Census Commissioner in the earlier censuses referred to the agricultural conditions of their respective charges and for India as a whole respectively. At the 1951 Census, all the State Census Superintendents were requested to prepare the following Subsidiary Tables and to review them in

their reports—

Subsidiary Table 4 7 — Progress of cultivation during three decades 1921-31, 1931-41 and 1941-51

Subsidiary Table 4 8 — Components of cultivated area *per capita* during three decades

Subsidiary Table 4 9 — Land area *per capita* (1951) and trend of cultivation *per capita* during three decades

6 For preparation of these tables cultivation statistics for the quinquennia* ending the years 1920, 1930, 1940 and 1950 were necessary. As in the case of vital statistics, cultivation statistics are unavailable for some parts of the

* Single year figures were unavailable because of fluctuations of cultivated area consequent on variation in seasonal conditions from year to year.

country; are available in others only for recent years but not for earlier years; and the degree of reliability also differs from state to state. In order to help the Census Superintendents in the preparation of their subsidiary tables, the Economic and Statistical Adviser to the Ministry of Food and Agriculture was requested to supply cultivation statistics for the average of five years immediately preceding the census years 1951, 1941, 1931 and 1921. Apart from the inherent defects in the statistics themselves, other difficulties had arisen. The partition of the country and the merger and integration of the former princely states made it extremely difficult to compile figures, especially for earlier quinquennia. In the circumstances, figures based on available data were supplied by the Economic and Statistical Adviser and these were communicated to the Superintendents as a provisional first draft of the statistics to be finally published. The Superintendents scrutinised the figures in close collaboration with local departments dealing with agriculture and land statistics and prepared their subsidiary tables. Some of the Superintendents had to modify the figures supplied by the Economic and Statistical Adviser, where it was certain that fuller and/or more up to date information was locally available and was known to be more accurate. Others retained the figures of the provisional first draft as given by the Economic and Statistical Adviser at the Centre. In such cases also, care was taken to secure that the local authorities were made aware of and had no objection to the figures which were finally adopted. Subsidiary tables prepared by the Superintendents on the basis thus explained are published in the state census reports.

7. GENERAL COMMENTS ON CULTIVATION STATISTICS

It has become customary in recent years to condemn the quality of our statistics without adequate discrimination between those which are reliable and those which are not. Such condemnation is usually accompanied by equally uncritical laudation of the statistics of other countries. Some comments of a general character on the nature of these statistics are, therefore, necessary. To begin with, a sharp distinction should be made between statistics of 'cultivated acreages' and statistics of 'yields and yield rates'. The methods of securing data are

different and the quality of data secured are also different.

In respect of statistics of cultivated acreages, India is equipped with a system which yields for the greater part of the sub-continent, very detailed data with a degree of accuracy which is probably as good as the best in the world. The system of 'village papers'—officially maintained records of village land, listed by field plots—can be traced back to well over two thousand years. It was greatly improved in the last century (as part of the processes of settlements and re-settlements of land revenue and rent). The principal improvements were made in three directions: *First*,—the linear measurements and area computations became scientifically exact and field plots were plotted on maps; *Secondly*,—the ancient office of village accountant—which had fallen on evil days—was resuscitated, reformed, and established on a secure basis permanently, and *Thirdly*,—the records as well as the holders of these village offices were put to use continually, kept under supervision and control, and thus brought to a high pitch of efficiency.

Unfortunately, all parts of the country did not benefit equally by these reforms. Territories under princely rule remained largely untouched—though there were a few states which undertook similar reforms. The permanently settled zamindaris needed very little by way of management of the land revenue. In the greater part of the areas where this system prevailed (but not all) the records were improved, but the office of village accountant was allowed to die out and there was very little of organised administrative linkage between the village and the Government. The poor quality of almost all statistics (as much else, besides, in the administrative field) is traceable to these weaknesses. In the temporarily settled zamindari areas, office of village accountant has been maintained, and, though land revenue management has not been as detailed as in raiyatwari areas, general administration has been strong enough to make adequate use of records and personnel. The resulting statistics are, therefore, of the same high quality. The main problem in all India compilation has been the treatment of those parts of India for which no statistics were received and those other parts where, owing to the absence of professional survey and/or the

absence of village accountants in physical contact with the land, the quality of statistics was poor. In recent years, the Ministry of Food and Agriculture has been making great efforts to close the gap and achieve complete cover. This task has been greatly complicated by the partition of the country and the merger and integration of the former Indian States which made it very difficult to compile figures and maintain comparability with earlier periods.

8 CATEGORISATION OF AREAS

In the light of this general appreciation it is obvious, that the statistics cannot be used effectively unless the areas are distinguished with reference to the nature and quality of their figures. Accordingly, four 'Statistical Categories' were adopted and the areas classified from the point of view of availability, reliability and comparability of cultivation statistics. The four categories are

Statistical Category 'A' territories

These are territories for which cultivation statistics of a reliable character are available on a comparable basis throughout at least the latest thirty-year period—1921-50. They include one state (Bombay) for which reliable data are available for a much longer period, but the element of comparability has been unfortunately spoiled in respect of the last few years, by the diffused inclusion of former princely states for which separate statistics are unavailable.

Statistical Category 'B' territories

These are territories for which cultivation statistics for the past three decades are available but are known to be generally less reliable than statistics for Category 'A' territories and include states where errors which affect comparability are known to exist.

Statistical Category 'C' territories

There are territories for which cultivation statistics are available round about 1950 but not continuously for earlier years. The quality of

such statistics is also of the same order as those of Category 'B' territories, or poorer.

Statistical Category 'D' territories

These are territories for which statistics even of the meagre kind described for Category 'C' territories are unavailable or are available only in a form which presents difficulties of localisation. For such territories a rough estimate has been attempted for 1951.

Annexure I to this Note shows against the name of each state the category to which it has been assigned. For Statistical Category 'D' territories, it also gives the basis on which the estimates have been arrived at.

9 RESULTS OF DETAILED EXAMINATION OF CULTIVATION STATISTICS

The figures given by the Economic and Statistical Adviser, the figures given by the Superintendents of Census Operations in their subsidiary tables, and the figures already published in the Census of India Paper No 2 of 1952 were examined in detail in order to locate gaps and discrepancies, remove errors, and fill in the gaps wherever material was available for the purpose. As a result of this examination it was concluded that the quality of the cultivation statistics obtaining in different states was so markedly different that an all-India consolidation for all states could not be attempted on a uniform basis i.e., by adopting in entirety either the Economic and Statistical Adviser's figures or the figures given by the Census Superintendents in their Subsidiary Tables or the figures given in Census of India Paper No 2 of 1952. It therefore became necessary to accept one of the three sets of figures in relation to each state separately as the best available statistics and to discard the other two. Which of the three sets of figures has been adopted in respect of each state is also given in *Annexure I*. On the basis of the foregoing analysis the best estimates for current cultivation statistics have been made. These are given in TABLE 1.4.

A reconciliation of the figures for Net Area Sown as given in TABLE 1.4 and the Census of India Paper No 2 of 1952 has been effected. The reconciliation statement is given as *Annexure II* to this Note.

Section III — Tables described

10 TABLE I 0 : CLASSIFICATION OF LAND BY TOPOGRAPHY, POPULATION AND AVERAGE ANNUAL RAINFALL

This table classifies the land area of each state and natural division by mountains, hills, plateaus, plains etc., and on the basis of this gives the extent of the topographically usable area of each state and natural division. As mentioned above, this information is based on data supplied by the Survey of India. The definitions adopted for purposes of this special compilation were as follows

Mountains Steep hills generally above 7,000 ft in altitude.

Hills Weathered high lands up to an elevation of 7,000 ft

Plateaus Relatively flat lands that lie at an elevation between 1,000 to 3,000 ft.

Plains Generally flat lands, with elevation up to 1,000 ft

Mountains, thus defined, include only the Himalayan ranges above 7,000 ft. in elevation and very small areas in the ranges of Peninsular India. Ranges below 7,000 ft. in the Himalayan as also all the ranges of Peninsular India, subject to the above exception, have been classified as hills.

Topographically usable area has been computed from these figures on the following basis

Topographical class	Proportion considered usable*
Mountains	5 per cent
Hills	25 per cent
Plateaus	75 per cent
Plains	95 per cent

In the plains there are large areas of sandy desert and marsh land, mostly in Rajasthan and

* These proportions have been adopted from the book, PEARSON AND HARRIS, "The World's Hunger", Cornell University Press, 1949. In this book the authors have calculated the topographically usable area for all the continents of the world.

This method of classification of topographically usable area should not be considered more exact than it actually is. It gives a general indication of the extent of topographically usable area in a large territory, say a continent, or a large country. It should not be taken to furnish a precise estimate of the topographically usable area in a relatively small area like a natural division. Thus the ratio of 75% for plateaus is somewhat low in many parts of India as is shown by the fact that in North Deccan the crop land (even area plus current fallow) is actually more than the area considered topographically usable.

Kutch. These have been separated and shown in *Annexure I* to this table. These areas are considered un-usable and have been excluded in calculating the topographically usable area for the plains.

11 COMMENTS ON TABLE I 0

It will be seen from this table that plains occupy 43% of the land area of the country, plateaus about 28%, hills about 18% and mountains about 11%. The topographically usable area totals nearly 505 million acres or 62% of the total land area of the country (500 million acres and 66% for the area of the 1951 Census). The proportion of the topographically usable area to the total land area is of course the highest (80%) in the Northern Plains region and lowest (34%) in the Himalayan region. The proportion for the Northern Plains region would be considerably higher, but for the inclusion in its western part (Rajasthan and Kutch) of large areas of sandy desert.

Topographically usable area *per capita* works out to an average of 1.40 acres for the country as a whole. The range of variation between the various divisions is fairly large—from 7.57 acres in Kutch to 0.35 acres in Travancore-Cochin. However, if extremes like Kutch and the Rajasthan Dry Area Division—where much of the area is really un-usable (or is of very low utility) because of low rainfall—are excluded, the range of variation is considerably reduced. In the plains divisions, the variation is generally between $\frac{1}{2}$ and $1\frac{1}{2}$ acres; and in the Peninsular hills and plateaus divisions between 1 and 3 acres *per capita*. It is not to be supposed that the assumptions made in the preparation of this table are, in any sense, final. How accurate and complete information of all the facts which determine the usability of land is to be ascertained, recorded and used is a problem with many aspects—for which solution is to be found. The table now presented is regarded as only the first step in the solution of the problem.

12 TABLE I 1 : DISTRIBUTION OF AREA OF REGIONS, SUB-REGIONS AND DIVISIONS BY RAINFALL (RAINFALL BELTS)

Just as the first table gives the distribution of the area of each natural region, sub-region and division by topographical classes, this table shows the distribution of area by rainfall belts.

Five rainfall belts have been distinguished on the basis of total annual rainfall. The area of each natural division, sub-region and region falling within the different rainfall belts has been shown in the table. This classification into five rainfall belts has been designed so as to conform to the observed differences in vegetation and agricultural patterns.

These rainfall belts have been shown in a map in the main report. For convenience of reference each rainfall belt is referred to hence-

forth by the colour by which it is shown in this map. Thus the belt with rainfall above 75 inches will be referred to as the Blue Belt, that with rainfall between 50" and 75" as the Dark Green Belt and so on.

This table has been prepared from the isohyetal map of India supplied by the Indian Meteorological Department. The area of each belt has been calculated by adding up areas of whole districts, and estimated areas of parts of districts, on the basis of this map.

Belt	Annual rainfall	Rainfall characteristics	Vegetational and agricultural characteristics
1. Blue Belt	above 75"	Rainfall generally dependable, rainy season longer than in the rest of the country mainly because of pre-monsoon storms; number of rainy days more than 75 per year	Evergreen forest, rice is the principal crop, other wet zone crops like jute, coconut and tea are important.
2. Dark Green Belt	50" to 75"	Rainfall generally dependable, rainy season shorter than in (1) above, number of rainy days 60 to 75 per year	Mixed evergreen and deciduous forest, rice still the principal crop, irrigation needed principally as a standby.
3. Light Green Belt	30" to 50"	Rainy season confined to the monsoon season, except in the South Madras area where rainfall occurs also from October to December, average number of rainy days range between 40 to 60 per year; rainfall less dependable and failures of rain experienced sometimes	Deciduous forest, mixed humid and dry zone crops; rice, wheat and millets principal foodgrains, rice and other wet crops predominate towards the wetter margins and wheat and millets towards the drier margins, irrigation necessary for the <i>rabi</i> crops and desirable as a standby for the <i>kharif</i> crop
4. Brown Belt	15" to 30"	Rainy season short, average number of rainy days between 25 and 45 per year, rainfall undependable and areas subject to frequent famines and scarcities	Thorn forest; dry zone crops; wheat and millets main cereals; irrigation needed for both <i>rabi</i> and <i>kharif</i> crops
5. Yellow Belt	Below 15"	Rainfall sporadic and undependable; number of rainy days below 20	Desert vegetation; dry zone crops like millets and wheat are grown; irrigation for cultivation necessary

Annexure I TO TABLE 1 'I

An abstract of the data furnished in the main table is given in this annexure. It also shows the proportion of area of India and its five natural regions falling under the different rainfall belts. It will be seen from this abstract that about one-third of the area of the country is included in the two humid belts—blue and dark green; one-third is in the sub-humid light green, and one-third in the two dry belts—

brown and yellow. Thus, it will be seen that in about two-thirds of the area of the country water deficiency is a major problem and irrigation a necessity. The intensity of moisture deficiency and the need for irrigation increases progressively as one moves towards areas of lower rainfall.

The above figure, however, does not fully bring out the extent of moisture deficiency or the need of irrigation in the agricultural areas of the country. Most of the area of the dark blue and dark green belts, which is well supplied with

moisture, is hilly and mountainous and is, therefore, not fit for agriculture. On the other hand, plains and plateau areas in which most of the agricultural land is situated, are mostly included in the yellow, brown or light green belts. Thus in the Himalayan region, 90% of the land is in the blue and dark green belts. By contrast, in the Northern Plains region where topography is more favourable for agriculture, 55% of the area is in the two dry belts—yellow and brown, and 85% of the area is included in the three belts—yellow, brown and light green.

Annexure II TO TABLE I

Further information on the brown and yellow belts is presented in this Annexure. It shows the distribution of the area of each belt by sub-regions, and makes estimates of the population of each belt. The estimates of population are based on the population of the districts or parts of districts included in the belts. The yellow belt is one contiguous area in the north-western part of the country. It includes a large area of western Rajasthan, most of Kutch and a small part of southern Punjab. The brown belt is, however, divided into three parts—northern, central and southern. The northern brown belt extends as a broad arc round the yellow belt from Punjab in the north to Saurashtra in the south. The central brown belt occupies a large area in the Peninsular Hills and Plateau region. It extends from the Vindhya in the north to the plateau of Mysore in the south and covers most of the area of the Deccan. The southern brown belt is a relatively small area in Madras. It gets separated from the central brown belt because of somewhat higher rainfall over Mysore and parts of Madras.

Extent of Irrigation in the dry belts. The availability of irrigation in the dry belts is shown in Annexure II to the next table—1.2. In this annexure, the area of each belt has been divided on the basis of availability of irrigation in the following manner:

- (i) TRACTS WITH GOOD IRRIGATION—where the percentage of irrigated area to the total area sown exceeds 20%.
- (ii) TRACTS WITH FAIR IRRIGATION—where the percentage of irrigated area to the total area sown is between 5% and 20%, and

- (iii) TRACTS WITH POOR IRRIGATION—where the percentage of irrigated area to the total area sown is less than 5%.

The total land area, population classification of land area, and the extent of irrigated area are shown for each belt and tract.

It will be seen from this annexure that in the yellow belt out of a total reported sown area of 7.7 million acres, 1.9 million acres or almost one-fourth is irrigated. Fifty-five per cent of the reported sown area is classified as being in tracts with good irrigation and the balance in those with fair irrigation.

In the northern brown belt, irrigation is available for about 10.6 million acres out of a total sown area of about 51 million acres. About 35% of the sown area is classified as being in tracts with good irrigation. Most of the irrigated area is also included in these tracts. Nearly half (24.4 million acres) of the sown area is classified as being in tracts with fair irrigation. But the total area receiving irrigation in these tracts is rather small, being 2.3 million acres or less than 10% of the total area sown.

In the southern brown belt also, availability of irrigation is good. About two-thirds of the sown area is classified as being in tracts of good irrigation and the balance in tracts of fair irrigation. In the central brown belt, however, irrigation is available only to a very limited extent. The total area receiving irrigation is only 2.9 million acres or about 6% of the total sown area. Nearly the entire belt is classified as being in tracts of fair or poor irrigation. The main reason for the small area of irrigation in the region is its hilly and plateau topography, by reason of which irrigation can be developed only in a few favoured localities.

Annexure III TO TABLE I

This annexure gives for the various rainfall divisions periods of successive years of deficient rainfall during 1891-1920 and 1921-50. The years in which the average annual rainfall was below the normal by 11% or more have been treated as years of deficiency.

13 TABLE 1.2 CLASSIFICATION OF LAND AREA (1951)

This table shows figures on classification of land into major land use classes—'forest,' 'not available for cultivation,' 'other un-cultivated

land excluding fallows', 'fallow land' and 'net area sown' for India, the zones and the sub-regions. It will be seen that the classification of land figures are available for only 623.4 million acres out of a total land area of 812.6 million acres. The balance of 190 million acres is the unclassified area for which returns of agricultural statistics are not available.

The distribution of the unclassified areas shows that they would be unproductive for the most part. The unclassified areas are located mostly in hilly, mountainous or desert regions. Nearly 60 million acres are in the Western Himalayan sub-region—mostly in Jammu and Kashmir State, another 40 million acres are in the Desert sub-region. Other large areas are also in the hilly or dry regions. In the fertile well-watered plains areas like the Lower and Upper Gangetic Plains sub-regions, or the two sub-regions of the East Coast, there is practically no unclassified area.

Sown area totals 268.4 million acres or 33% of the total land area (43% of the classified area). Current fallows total another 59.4 million acres. Total crop-land (net area sown plus current fallows), therefore, totals 327.8 million acres, which is 40% of the total land area of the country and 52.6% of the classified area. It may be mentioned that the proportion of crop-land to the total land area in India is about the highest among the large countries of the world. Also, we have noticed that the topographically usable area amounts to 505 million acres. If from this total are taken out areas which are unsuitable on climatic and other grounds, the areas needed for pastures and areas which must remain under non-agricultural uses like villages, towns, cities, roads etc., it is clear that a very high proportion of the cultivable area is already occupied by cultivation purposes. The figures of column 11 in this table are very significant in this connection. These show the proportion of crop-land (sown area plus current fallows) to the total classified area in the various zones and sub-regions. It will be seen that in quite a few cases the figure is between 60% and 70% and in some, e.g., North Deccan and the Lower Gangetic Plain, it is between 72% and 75%. The figures reflect the intensity of the land use, the result of efforts through the centuries to bring as large an area of land under cultivation as possible.

14 TABLE 1.3 CROPPING PATTERN

This table shows the cropping pattern or the distribution of the sown area among major crops in India, the six zones and the fifteen sub-regions. The main points brought out by this table are well-known, namely :

- (i) that foodgrains occupy nearly 80% of the total sown area in the country,
- (ii) that among the foodgrains, the largest acreage is under rice (70 million acres or nearly 23% of the sown area), millets come next with 60 million acres and 20% of the sown area, and wheat comes third with 24 million acres and 8% of the sown area, and
- (iii) that among the non-food crops, oil seeds and fibres (cotton and jute) are the most important. Other crops like tea, tobacco, coffee, though of high value, occupy small areas.

The small acreage (about 5% of the sown area) under fodder-crops is significant. It shows that the agricultural economy of India like that of China, Japan and other countries of Monsoon Asia, is based on the production of crops. It is not a crop-and-livestock economy as is the mixed agriculture of western Europe or eastern United States. Therefore, in spite of the fact that India has the largest number of cattle in the world and very large number of sheep and goats, barely 5% of the sown area can be spared for growing fodder-crops. In contrast, in U.S.A. besides vast areas of pasture lands, more than one-fifth of the entire crop-land is devoted to production of hay, nearly all the corn (which is the most important cereal grown), is used for feeding livestock, as also large quantities of oats, barley and other cereals.

Differences in the cropping patterns in different parts of the country reflect mainly the influence of the varying topographic and climatic conditions. Thus, the distribution of rice, wheat, millets and other crops is the result of these natural factors, modified by such human effort as provision of irrigation.

15 TABLES 1.4 AND 1.5. CULTIVATION—ACREAGE NORMS AND PER CAPITA

TABLES 1.4 and 1.5 bring out the relationship between population and cultivation in different

parts of the country. TABLE 1.4 shows the population, the sown area and the irrigated area in 1951 in India, the six zones, and the fifteen sub-regions. In this table, consolidated totals for 'A', 'B' and 'C' categories—which are recorded statistics, and separate totals for the 'D' category—which are estimates—have been given. An estimate of the population of areas of 'D' categories have also been made. It will be seen from this table that areas of 'A', 'B' and 'C' categories cover 633 million acres of land, have a sown area of 256.8 acres and a population of 332.8 millions. The area of 'D' category is 180 million acres. Sown area among them is estimated at 29.9 million acres and the population at 28.5 millions.

In TABLE 1.5, the 'D' category areas are excluded and the information for 'A', 'B' and 'C' categories is given in much greater detail. Population, net area sown, area sown more than once, area irrigated and area irrigated more than once are given separately for 'A', 'B' and 'C' categories, for the zones, states and the natural divisions. The latter part of this table shows cultivation *per capita* and its components by zones, states and divisions. The components of cultivation *per capita* are calculated as follows.

Where 'P' is the population of the area to which cultivation statistics relate and 'A₁' is net area sown; 'A₂' area sown more than once, 'A₃' area irrigated; and 'A₄' area irrigated more than once—

- (1) Irrigated Double Crop (col 24)

$$= \frac{A_4}{P} \times 100 \text{ cents}$$

- (2) Irrigated Single Crop (col 23)

$$= \frac{A_3 - A_4}{P} \times 100 \text{ cents}$$

- (3) Unirrigated Double Crop (col 22)

$$= \frac{A_2 - A_4}{P} \times 100 \text{ cents}$$

- (4) Unirrigated Single Crop (col 21)

$$= \frac{(A_1 - A_2) - (A_3 - A_4)}{P} \times 100$$

The average cultivated area *per capita* works out at 77 cents for the country as a whole. Of this, 63 cents or about 80% is un-irrigated and 14 cents or 20% is irrigated. Difference in cultivation *per capita* are quite marked even among zones, the variation being from 53 cents in South India to 132 cents in Central India. Differences between natural divisions are of course much greater, the range being from 0.3 acres in Travancore-Cochin to 1.85 acres in Bhopal. In general, one may say, that cultivation *per capita* is lowest in the plains areas with high rainfall where rice is the main crop, higher in the plains with medium or low rainfall, and higher still in the low and medium rainfall areas of Peninsular Hills and Plateau region.

16. TABLES 1.6, 1.7 AND 1.8 : TRENDS IN CULTIVATION PER CAPITA

TABLE 1.6 gives the population, cultivation and trends in cultivation *per capita* for three decades 1921 to 1951, for the states and natural divisions of 'A' and 'B' categories, in which case alone are the agricultural statistics of a sufficient degree of comparability to make such long term comparisons possible.

TABLES 1.7 and 1.8 take the comparison further back and show the trends in population, cultivation and cultivation *per capita* for six decades 1891 to 1951. This analysis could only be done in areas where the agricultural statistics over this long period were of sufficient degree of reliability and also where there had been no appreciable territorial changes. Only 8 divisions and parts of 5 divisions could meet these requirements. The data for individual divisions (or parts of divisions) are given in TABLE 1.8. TABLE 1.7 gives the India and zonal consolidations from this table.

Decline of cultivation *per capita* since 1921 stands out as an unmistakable characteristic of the divisions studied. A discussion of the significance of these figures will be found in Chapter IV of the Report.

17. TABLE 1.9 AND Annexures : MINERAL PRODUCTION

This table and the two annexures show the value of the mineral production in India and its distribution by natural sub-regions and divisions, and by important minerals produced.

The figures of these tables are averages of five years 1946 to 1950. They have been compiled from Geological Survey of India's annual publications 'Mineral Production in India' for the years 1947 to 1952. Figures on distribution of production by natural divisions have been arrived at by location of individual producing deposits, by natural divisions.

It will be seen from the tables that coal is by far the most important mineral produced in the country. The average value of mineral production during these five years was Rs. 74 crores per year. Of this more than half (Rs. 44 crores) was contributed by coal. Other principal minerals in order of value of output are mica, gold, manganese ore, petroleum, iron ore and copper ore.

TABLE 1'9 shows the value of mineral production in important mineral producing divisions. The divisions have been arranged in order of importance in mineral production. Many of the divisions in which the value of mineral production is very small (e.g., divisions of Upper Gangetic Plains sub-region) have not been shown.

Annexure I shows the distribution of the principal minerals by natural divisions.

Annexure II shows the minerals arranged by the order of value of production.

It will be seen from these tables that mineral production in India is concentrated in a few localities. The most important of these is the North-East Plateau sub-region. The average value of the mineral production of the three divisions of this sub-region amounted to Rs. 49 crores out of the country's total of Rs. 74 crores or nearly two-thirds. The value of production of the Chhota Nagpur division alone averaged Rs. 44 crores. This division alone produces over

four-fifths of the country's coal, about half of the iron ore (the other half comes from the Orissa Inland division of this sub-region), more than half of the mica, all the copper and nearly all the kyanite production of the country. The North East Plateau sub-region as a whole is the sole or leading producer in the country of the following minerals: coal, iron ore, manganese, mica, copper, chromite, graphite etc.

Outside this sub-region, the principal mineral productions are: gold in Mysore, petroleum and tertiary coal in Assam; coal in Madhya Pradesh, Hyderabad and Vindhya Pradesh; ilmenite and monazite from the coastal sands of Travancore-Cochin, mica in North Madras and Rajasthan Plateau divisions and salt all along the sea coasts of the country.

18 TABLES 2'0 TO 2'9: YIELD RATES

TABLE 2'0 gives the official 'yield rates' of foodgrains—figures obtained from the Directorate of Economics and Statistics, Ministry of Food and Agriculture. TABLES 2'1 to 2'6 give the yield rates as compiled by Dr. V.G. PANSE, Statistical Adviser, Indian Council of Agricultural Research. TABLES 2'7 to 2'9 give the yield rates based on Crop-cutting Experiments carried out by the Indian Council of Agricultural Research.

19 TABLES SERIES 3, 4, 5 AND 6: POPULATION AND LAND USE — COMPARISONS WITH OTHER COUNTRIES

TABLES 3'0 to 3'2 give the comparative figures for population and land use in India and the World.

TABLES 4'0 to 4'3, 5'0 to 5'3 and 6'0 to 6'2 give figures for population and land use for Great Britain, the United States of America and the Union of Socialist Soviet Republics respectively. A review of the figures in the tables is given in the note preceding each series.

Annexure I to the Introductory Note

[ALL FIGURES RELATE TO NET AREA SOWN]

<i>State</i>	<i>Statistical Category</i>	<i>Figures adopted for 1951</i>	<i>Per cent</i>
Uttar Pradesh . . .	A	State Superintendent's Subsidiary Tables	
Bihar . . .	B	State Superintendent's Subsidiary Tables	
Orissa . . .	B	State Superintendent's Subsidiary Tables	
West Bengal . . .	B	State Superintendent's Subsidiary Tables	
Assam . . .	B	State Superintendent's Subsidiary Tables	
Manipur . . .	D	Estimates	
Sikkim . . .	D	Estimates	
Madras . . .	A	State Superintendent's Subsidiary Tables	

Annexure I to Introductory Note—*contd.*

State	Statistical Category	Figures adopted for 1951	Remarks
Mysore . . .	A	State Superintendent's Subsidiary Tables	These figures are same as those supplied by the Economic and Statistical Adviser.
Travancore-Cochin	B	-ditto-	-ditto-
Coorg . . .	B	-ditto-	All the three sets of figures for this state are identical.
Bombay . . .	A	State Superintendent's Subsidiary Tables	These figures have a much wider coverage than that of either the Economic and Statistical Adviser's figures or the Census of India Paper No 2 figures
Saurashtra . . .	D	Estimates	Neither of the three sets of figures have complete coverage. The Census of India Paper No 2 figures for the reporting area have, therefore, been raised to full cover in the population proportion
Kutch . . .	C	Census of India Paper No. 2 of 1952	.. ..
Madhya Pradesh	A	State Superintendent's Subsidiary Tables	(1) The Superintendent's figures exclude the merged states. To these have been added 4,249 thousand acres as follows : 28 thousand acres in 3·24 North-West Madhya Pradesh Division ; and 4,221 thousand acres in 3·32 East Madhya Pradesh division.
Madhya Bharat	C	Census of India Paper No. 2 of 1952	(2) The Superintendent's figures for the unaffected 3·41 South-West Madhya Pradesh division is same as supplied by the Economic and Statistical Adviser
Hyderabad			
Bhopal			
Vindhya Pradesh			
Rajasthan	D	Estimates	Due to the various changes in the territorial limits during the quinquennium preceding 1951, averaged figures are unrepresentative. Paper No 2 of 1952 figures, for these states, which relate to 1949-50 only, have therefore been taken. Estimates for three divisions have been made by raising in population proportion the figures for reporting areas in each division ; and for the fourth : e 3·11 Rajasthan Hills division (which is entirely non-reporting) on the basis of figures for 3·14 Madhya Bharat Hills division. The estimated figures in thousand acres are as follows : 2·34 East Rajasthan Plain division 6,368 2·41 Dry Area division . . . 3,109 3·11 Rajasthan Hills division . . 3,330 3·12 Rajasthan Plateau division . 2,728 15,535

Annexure I to Introductory Note—contd.

<i>State</i>	<i>Statistical Category</i>	<i>Figures adopted for 1951</i>	<i>Remarks</i>
Punjab	A	State Superintendent's Subsidiary Tables	..
PEPSU	B	-ditto-	.. ..
Ajmer	B	-ditto-	These figures are same as those supplied by the and Statistical Adviser
Delhi	B	-ditto-	.
Himachal Pradesh and Bilaspur	C	Census of India Paper No 2 of 1952	

Annexure II

[ALL AREA FIGURES RELATE TO NET AREA]

<i>Zone</i>	<i>Area according to Census of India Paper No 2 of 1952</i>	<i>Area not included in Paper No 2 but included in figures for Statistical Categories A, B, C or D, with Code No. of the division</i>	<i>Total</i>
I	2	3	4
I. North India	39,300	..	39,300
II. East India	46,411	5,981	52,392
		$\left\{ \begin{array}{l} 1'23 - 350 \\ 1'26 - 86 \\ 3'33 - 4,995 \\ 5'11 - 550 \end{array} \right\}$	
III. South India	40,414	..	40,414
IV. West India	45,363	4,740	50,103
		$\left\{ \begin{array}{l} 3'43 - 580 \\ 3'52 - 164 \\ 4'11 - 445 \\ 4'12 - 3,469 \\ 4'22 - 82 \end{array} \right\}$	
V. Central India	68,916	..	68,916
VI. North-West India	28,025	7,262	35,287
		$\left\{ \begin{array}{l} 2'34 - 3,057 \\ 2'41 - 141 \\ 3'12 - 3,330 \\ 3'12 - 734 \end{array} \right\}$	
INDIA	<u>268,429</u>	<u>17,983</u>	<u>286,412</u>

to Introductory Note

SOWN AND ARE IN THOUSANDS]

<i>Area included in figures for Statistical Categories A, B, and C</i>	<i>Area included in Statistical Category D, and Code No. of the division</i>	<i>Total</i>	<i>Difference (+) or (-)</i>
5	6	7	8
39,304	..	39,304	-4
51,654	846	52,500	-108
	$\left\{ \begin{array}{l} 1 \cdot 23 - 350 \\ 1 \cdot 25 - 410 \\ 1 \cdot 26 - 86 \end{array} \right\}$		
40,358	..	40,358	+56
43,095	7,006	50,101	+2
	(4·12—7,006)		
64,814	4,249	69,063	-147
	$\left\{ \begin{array}{l} 3 \cdot 24 - 28 \\ 3 \cdot 32 - 4,211 \end{array} \right\}$		
17,565	17,793	35,358	-71
	$\left\{ \begin{array}{l} 1 \cdot 14 - 2,258 \\ 2 \cdot 34 - 6,368 \\ 2 \cdot 41 - 3,109 \\ 3 \cdot 11 - 3,330 \\ 3 \cdot 12 - 2,728 \end{array} \right\}$		
<u>256,790</u>	<u>29,894</u>	<u>286,684</u>	<u>-272</u>

Population and Classification of Land by Topographically

State and division	Total land area	Land area PER CAPITA	Land area	
			Plains	Plateaus
1	2	3	4	5
INDIA				
Area of states and territories where				
1951 Census was taken	753,189,120	2 11	349,525,952	223,226,240
Jammu and Kashmir	59,379,200	13 46	296,832	1,611,392††
TOTAL	812,568,320	2 25	349,822,784	224,837,632
NORTH INDIA				
Uttar Pradesh	72,536,672	1 15	57,234,624	3,395,648
1 11 Himalayan Uttar Pradesh	12,474,880	4 95	864,064	306,048
2 14 East Uttar Pradesh Plain	13,473,728	0 75	13,330,944	142,784
2 21 Central Uttar Pradesh Plain	14,341,440	0 89	14,329,536	11,904
2 22 West Uttar Pradesh Plain	22,230,016	0 98	21,874,688	204,864
3 21 Uttar Pradesh Hills and Plateaus	10,076,608	2 58	6,835,392	2,730,048
EAST INDIA				
Bihar	45,011,072	1 12	25,139,520	13,954,176
2 12 North Bihar Plain†	13,796,672	0 76	13,189,824	354,560
2 13 South Bihar Plain†	9,992,000	0 89	8,906,752	799,296
3 31 Chhota Nagpur	21,222,400	1 95	3,042,944	12,800,320
Orissa	38,486,976	2 63	18,280,512	5,994,304
3 33 Orissa Inland	31,647,424	3 97	12,283,968	5,994,304
5 11 Orissa Coastal	6,839,552	1 02	5,996,544	
West Bengal	19,696,192	0 79	19,087,744	
1 25 Himalayan West Bengal	3,118,144	1 54	2,509,696	
2 11 West Bengal Plain	16,578,048	0 73	16,578,048	
Assam	54,407,872	6 02	16,291,456	
1 21 Assam Plains	15,587,072	2 00	14,284,288	
1 22 Assam Hills	38,820,800	31 35	2,007,168	
1 23 Manipur	5,518,272	9 55		436,992
1 24 Tripura	2,580,288	4 04	1,620,544	
1 26 Sikkim	1,756,480	12 75		
Chandernagore	2,496	0 08	2,496	
SOUTH INDIA				
Madras	81,785,600	1 13	48,013,632	13,098,112
3 54 Madras Deccan	16,899,456	3 35	4,285,056	9,349,504
4 23 West Madras	6,917,338	1 02	3,508,416	
5 12 North Madras	22,458,638	1 56	16,880,128	395,968
5 21 South Madras	35,469,568	1 14	23,340,032	3,352,640

* Estimated population as on 1st March 1951. No census was taken in 1951 in Jammu and Kashmir State.
† Separate figures for Sahibganj district which is in North Bihar Plain division are not available. They are included
†† Includes swamps and wetland/marshy areas which have been excluded in calculating topographically usable areas
‡ The figures in brackets represent the topographically usable area per capita, if the sandy waste and/or watery areas

Land Use Table 10

usable area, population and average annual rainfall

[ALL AREA FIGURES ARE IN ACRES]

classified as

Hills	Mountains	Topographically usable area	1951 Census Population	Topographically usable area PER CAPITA	Average annual rainfall IN INCHES
6	7	8	9	10	11
147,007 456 2,690 048	32,520,472 54,760,928	499,660,168 4,743,744	356,879,394 4,410,000*	1 40 (1 51) 1 08	42.50 39 04
150,597,504	87,310,400	504,423,912	361,289,394	1 40	.
4,092,608 3,430,976	7,873,792 7,873,792	58,337,824 2,301,868 12,771,520 13,621,952	63,215,741 2,521,987 17,686,802 16,129,890	0 92 0 91 0 71 0 84	42 25 67 58 43 71 36 93
150,464 511,168		20,972,672 8,668,992	22,771,251 3,905,811	0 92 2 22	33 22 36 47
5,917,376 252,268 235,952 5,379 136	...	35,887,642 12,859,392 9,132,352 13,895,898	40,225,947 18,173,633 11,186,563 10,866 351	0 89 0 71 0 82 1 28	50 63 50 98 43 81 53 62
14,212,160 13,369,152 643,008		25,415,296 19,507,776 5,907,520	14,645,946 7,972,895 6,673,051	1 74 2 45 0 89	58 53 58 77 57 43
288,832 288,832	319,616 319,616	18,211,568 1,831,744 16,369,824	24,810,308 2,030,956 22,779,352	0 73 0 90 0 72	68 70 136 56 55 94
25,452,608 1,302,784 24,149,824	12,663,808 12,663,808	22,473,088 13,631,680 8,641,408	9,043,707 7,805,558 1,238,149	2 48 1 77 6 98	138 93 94 03 156 96
4,872,832 959,744	208,448 ...	1,556,352 1,779,456	577,695 639,029	2 69 2 78	94 56 83 35
412,800 ..	1,343,680 ..	149,760 2,368	137,725 40,909	1 09 0 05	140 82 ..
20,307,136 3,264,896 3,180,672 5,182,592 8,678,976	366,720 268,800 97,920	60,531,840 11,899,200 4,141,632 17,628,800 26,862,208	57,016,002 5,037,655 6,819,062 14,433,481 30,725,804	1 06 2 36 0 61 1 22 0 87	42 51 24 05 129 54 38 59 36 72

In the figures for Bhagalpur district in the South Bihar Plain division (Col 8) Details of the areas are given in the *Annexure* to this table are not excluded altogether. (See para 11 of Introductory Note)

Population and

State and Division	Total land area	Land area PLR CAPITA	Plains	Land area Plateaus
1	2	3	4	5
3 53 Mysore	18,873,896	2 08		15,426,560
4 24 Travancore-Cochin	5,852,896	0 63	2,600,704	
4 25 Coorg	1,015,040	4 42		113,792
WEST INDIA				
Bombay	71,213,440	1 98	24,260,800††	28,378,560
3 43 Bombay Deccan Northern	28,901,312	2 34	3,052,928	17,717,888
3 52 Bombay Deccan Southern	11,154,880	2 37		9,826,496
4 11 Bombay Gujrat	21,103,616	1 85	17,845,606††	157,248
4 21 Greater Bombay	88,000	0 03	81,600	
4 22 Bombay-Konkan	9,065,632	2 14	3,280,576††	676,928
4 12 Saurashtra	13,654,592	3 30	12,093,408††	
4 13 Kutch	10,863,616	19 14	10,321,728††	
CENTRAL INDIA				
Madhya Pradesh	83,375,424	3 92	20,499,072	40,393,408
3 24 North West Madhya Pradesh	24,094,080	4 39	3,294,400	12,775,296
3 32 East Madhya Pradesh	43,871,552	4 30	13,095,104	17,665,152
3 41 South-West Madhya Pradesh	15,409,792	2 77	4,109,568	9,052,960
Madhya Bharat	29,786,560	3 74	6,870,912	19,705,648
3 35 Madhya Bharat Lowland	5,223,232	3 09	3,431,552	1,766,080
3 13 Madhya Bharat Plateau	17,580,224	3 81	620,800	15,556,992
3 14 Madhya Bharat Hills	6,983,104	4 24	2,818,560	2,382,164
Hyderabad	52,571,840	2 82	9,461,568	36,715,776
3 42 North Hyderabad	17,796,096	2 99		16,239,680
3 51 South Hyderabad	34,775,744	2 74	9,461,568	20,476,096
3 22 Vindhya Pradesh	15,104,512	4 23	2,383,936	11,783,616
3 23 Bhopal	4,402,240	5 26	287,360	3,567,328
NORTH WEST INDIA				
Rajasthan	83,353,280	5 45	52,056,384††	27,129,600
3 34 East Rajasthan Plain	18,849,216	2 86	6,481,084††	11,425,280
2 41 Rajasthan Dry Area	48,212,288	10 47	44,680,064††	2,916,864
3 11 Rajasthan Hills	7,725,888	3 69	136,448	5,071,616
3 12 Rajasthan Plateau	8,565,888	4 27	757,888	7,715,840
Punjab	23,922,368	1 89	15,928,896††	1,247,168
1 13 Himalayan Punjab	6,368,640	6 48	54,592	151,360
2 31 Punjab Plain	17,553,728	1 51	15,874,304††	1,095,808
1 12 Himachal Pradesh and Bilaspur	6,981,952	6 29		
2 32 Patiala & East Punjab States Union	6,428,032	1 84	5,820,992††	198,656
2 33 Delhi	369,664	0 21	369,664	
2 36 Ajmer	1,521,856	2 19		1,387,008
Andaman and Nicobar Islands	2,057,792	66 44		

NOTE.—There is a difference of 1,280 acres or 2 sq miles between the total area of India shown in this Table (Col 2) that the figures in this table are based on a later computation of the Surveyor General of India. In the area figures for the

Land Use Table 10—contd.

[ALL AREA FIGURES ARE IN ACRES]

classified as		Topographically usable area	1951 Census Population	Topographically usable area PER CAPITA†	Average annual rainfall IN INCHES
Hills	Mountains				
6	7	8	9	10	11
3,446,370		12,431,488	9,074,972	1 37	36 24
3,169,472	81,920	3,267,136	9,280,425	0 35	94 04
901,248		310,656	229,405	1 35	106 31
18,574,080		47,822,926	35,956,150	1 33 (1 36)	35 65
8,130,496		18,221,440	12,364,735	1 47	36 68
1,328,384		7,701,888	4,698,479	1 64	29 17
3,100,672		16,773,312	11,396,789	1 47 (1 57)	36 13
6,400		65,152	2,839,270	0 023 (0 028)	76 50
6,008,128		5,061,134	4,656,877	1 09 (1 10)	114 67
661,184		12,192,832	4,137,359	2 95 (3 03)	22 65
541,888		4,294,144	567,606	7 57 (18 04)	14 38
22,482,944		55,390,656	21,247,533	2 61	50 16
8,024,384		14,717,888	5,450,410	2 68	47 97
13,111,296		28,967,040	10,199,360	2 84	56 24
1,347,264		11,705,728	5,557,763	2 11	36 30
3,210,112		22,108,928	7,954,154	2 78	37 39
25,600		4,590,976	1,691,858	2 71	27 85
1,402,132		12,607,936	4,615,661	2 73	37 48
1,782,080		4,910,016	1,646,635	2 98	33 00
6,394,496		38,123,776	18,655,108	2 04	33 08
1,556,416		12,568,704	5,945,404	2 11	30 53
4,838,080		25,555,072	12,708,704	2 01	34 73
936,960		11,336,704	3,574,690	3 17	43 72
247,552		3,235,392	836,474	3 87	48 61
4,167,296		44,687,552	15,290,797	2 92 (4 75)	17 84
941,952		12,930,816	6,585,367	1 96 (2 34)	23 17
615,260		20,664,256	4,603,784	4 49 (10 00)	11 00
2,517,824		4,562,752	2,093,396	2 18	30 39
92,160		6,529,728	2,008,250	3 25	33 28
1,819,328	4,926,976	14,165,952	12,641,205	1 12½ (1 34)	37 79
1,235,712	4,926,976	720,640	982,192	0 73	70 83
583,616		13,445,312	11,659,013	1 15 (1 39)	25 81
2,237,440	4,744,512	796,672	1,109,466	0 72	.
408,384		3,221,376	13,493,685	0 92 (1 69)	18 96
		351,168	1,744,072	0 20	21 91
134,848	...	1,073,984	693,372	1 55	20 10
2,067,792	...	814,432	38,971	16 61	123 33

and those shown in Census of India Paper No 2—1952 (Col 2 of Table I, pp. 18—19). This difference is due to the fact division also there are minor changes from those given in the Census of India Paper No 2 of 1952.

Population and

Zone, Region and Sub region	Total land area	Land area PER CAPITA	Land area	
			Plains	Plateaus
I	2	3	4	5
I. North India	72,896,672	1 15	57,234,624	3,395,648
II. East India	167,459,648	1 86	80,412,272	20,385,472
III. South India	107,525,632	1 41	50,614,436	28,638,464
IV. West India	95,731,648	2 35	47,575,936	28,378,560
V. Central India	186,240,576	3 54	39,502,848	112,465,664
VI. North-West India	122,577,152	3 51	74,175,936	29,962,432
1. Himalayan Region	93,206,528	5 47	21,340,352††	894,400
1 1 Western Himalayan Sub-Region	25,825,172	5 60	918,656††	457,408
1 2 Eastern Himalayan Sub-Region	67,381,096	5 42	20,421,696	435,992
2. Northern Plains Region	188,572,416	1 35	164,870,848††	20,303,104
2 1 Lower Gangetic Plains Sub-Region	53,842,044	0 77	52,003,064	1,296 640
2 2 Upper Gangetic Plains Sub-Region	36,571,456	0 04	36 204,224	216,768
2 3 Trans-Gangetic Plains Sub-Region	49,945,728	1 93	31,979,496††	15,872,832
2 4 The Desert Sub-Region	48,212 288	10 47	44,680,064††	2,916,864
3. Peninsular Hills and Plateau Region	335,084,096	3 09	66,465,920††	197,332,160
3 1 North-West Hills Sub-Region	40,855,104	3 94	4,333,696	30,726,912
3 2 North-Central Hills and Plateau Sub-Region	53,677,440	3 89	12,801,088	31,156,288
3 3 North-East Plateau Sub-Region	96,741,376	3 33	28,422,016	36,459,776
3 4 North Deccan Sub-Region	62,107,200	2 60	7,162,496	43,910,528
3 5 South Deccan Sub-Region	81,702,976	2 59	13,746,624††	55,078,656
4. Western Ghats and Coastal Region	69,500,480	1 74	50,632,128	947,968
4 1 Gujarat-Kachhiwar Sub-Region	45,621,824	2 83	41,160,832††	157,248
4 2 Malabar-Konkan Sub-Region	23,878,656	1 00	9,471,296††	790,720
5. Eastern Ghats and Coastal Region	64,767,808	1 25	46,216,704	3,748,608
5 1 North Madras and Orissa Coastal Sub-Region	29,298,240	1 39	22,876,672	395,608
5 2 South Madras Sub-Region	35,469,568	1 15	23,340,032	3,352,640

Source Census of India Paper No 2 of 1952 (Section XIX)

Land Use Table 10 — *concl'd.*

[ALL AREA FIGURES ARE IN ACRES]

classified as:

<i>Hills</i>	<i>Mountains</i>	<i>Topographically usable area</i>	<i>1951 Census Population</i>	<i>Topographically usable area PER CAPITA</i>	<i>Average annual rainfall IN INCHES</i>
6	7	8	9	10	11
4,092,608	7,873,792	58,337,824	63,215,742	0 92	42 25
52,116,352	14,535,552	105,485,530	90,130,205	1 17	86 16
27,824,192	448,640	76,541,120	75,600,804	1 01	44 82
19,777,152		64,309,902	40,661,115	1 58	39 28
33,272,064		130,195,456	52,267,959	2 49	43 32
8,767,296	9,671,488	64,296,704	34,972,597	1 84	22 07
38,890,944	32,080,832	31,609,600	17,042,694	1 85	92 00
6,904,128	17,545,280	3,819,200	4,613,645	0 83	50 02
31,986,816	14,535,552	27,790,400	12,429,052	2 24	108 00
3,398,464		142,027,968	139,447,952	1 02	26 94
538,240		51,155,456	70,075,659	0 73	50 46
150,464		34,594,624	38,901,142	0 89	34 45
2,094,400	..	35,613,632	25,867,367	1 38	24 29
615,360	.	20,664,256	4,603,784	4 49	11 00
71,286,016	...	229,023,642	108,598,645	2 11	41 96
5,794,496	...	28,610,432	10,363,942	2 76	34 55
9,720,064	...	37,958,976	13,807,385	2 75	44 21
31,859,584	...	62,370,714	29,038,606	2 15	55 80
11,034,176	...	42,495,872	23,868,902	1 78	35 56
12,877,696	...	57,587,648	31,519,810	1 83	31 98
17,569,664	350,720	46,106,998	39,926,793	1 15	58 29
4,030,744		33,260,288	16,101,754	2 07	32 75
13,265,920	350,720	12,845,710	23,825,039	0 54	107 22
14,704,576	97,920	50,398,528	51,832,336	0 97	41 40
6,025,600	..	23,636,320	21,106,532	1 12	45 10
8,678,976	97,920	26,862,208	30,725,804	0 87	36 72

Annexure to Population and Land Use Table 10

Location of sandy waste and watery/marshy areas

Zone, State, Division or District	Area in Acres
WEST INDIA	74,59,856
Bombay	1,212,800
BOMBAY-GUJRAT DIVISION	1,129,600
Ahmedabad	67,136
Amreli	6,428
Banaskantha	641,664
Broach	129,664
Kaira	69,952
Surat	211,584
Baroda	3,072
GREATER BOMBAY DIVISION	14,720
BOMBAY-KOCHKAN DIVISION	68,480
Kolaba	16,640
Thana	51,840
SAURASHTRA DIVISION	332,864
KUTCH DIVISION	5,944,192
NORTH-WEST INDIA	33,502,848
Rajasthan	27,865,416
EAST RAJASTHAN PLAIN DIVISION	2,475,328
Jaipur	246,336
Jhunjhuna	1,187,392
Sikar	1,041,600
RAJASTHAN DRY AREA DIVISION	25,393,088
Bharatpur	5,100,160
Bikaner	1,387,648
Churu	2,110,592
Ganganagar	4,804,224
Jaisalmer	5,338,896
Jalore	1,651,968
Jodhpur	2,547,584
Nagore	1,802,016
Punjab	2,740,096
PUNJAB PLAIN DIVISION	2,740,096
Ferozepore	770,624
Hissar	1,568,960
Ludhiana	461,248
Rohatak	139,264
Patiala & East Punjab States Union	2,694,336
TOTAL	49,792,704

Note.—The sandy waste and watery/marshy areas shown in the above statement, though included in the area figures for Plains in column 4 of the Population and Land Use Table 10, are not taken into account for arriving at the topographically usable area, given in column 8 of that table. The figure of 1,611,392 acres shown against Jammu and Kashmir in column 5 — Plateau, in Table 10 similarly includes 211,072 acres which are sandy wastes.

Population and Land Use Table 1'1
Regions, sub-regions and divisions classified by rainfall (Rainfall belts)

Regions, Sub-Regions and Divisions	Total area (in '000 ACRES)	Average annual rainfall (in INCHES)	Area (in '000 ACRES) having an annual average rainfall of						Average number of rainy days
			Above 75" (Blue belt)	Between 50-75" (Dark Green belt)	Between 30-50" (Light Green belt)	Between 15-30" (Brown belt)	Between 10-15" (Yellow belt)	Below 10" (Yellow belt)	
1	2	3	4	5	6	7	8	9	10
INDIA (States and territories where the 1951 Census was taken)	753,159	42	83,359*	267,343*	254,342*	187,990*	42,228*	15,369*	
1 Northern Region	85,206	92	60,523	23,412	8,255				
1.1 Western Himalayan Sub-Region	25,823	50	3,495	13,420	8,910				
1.1.1 Himalayan U.P. Division	12,475	68	2,859	7,753	1,863				70
1.1.2 Himachal Pradesh and Jilaspur Division	6,982	N.A.		3,752	3,230				N.A.
1.1.3 Himalayan Punjab Division	6,366	71	636	1,915	3,817				75
1.2 Eastern Himalayan Sub-Region	67,381	108	57,034	10,022	325				
1.2.1 Assam Plains Division	15,587	94	12,072	3,515					112
1.2.2 Assam Hills Division	38,821	157	34,748	3,748	325				N.A.
1.2.3 Manipur Division	5,418	95	2,759	2,759					N.A.
1.2.4 Tripura Division	2,580	83	2,580						100
1.2.5 Himalayan West Bengal Division	3,118	137	3,118						109
1.2.6 Sikkim Division	1,757	141	1,757						N.A.
2 Northern Plains Region	165,372	27	640	27,821	51,828	54,613	54,101	18,359	11
2.1 Lower Gangetic Plains Sub-Region	53,843	50	640	24,762	28,441				
2.1.1 West Bengal Plain Division	16,580	56		16,580					73
2.1.2 North Bihar Plain Division	13,797	51	640	4,871	8,286				55
2.1.3 South Bihar Plain Division	9,892	44		1,369	8,623				54
2.1.4 East U.P. Plain Division	13,474	44		1,942	11,532				50
2.2 Upper Gangetic Plains Sub-Region	36,571	34		3,059	24,805	8,707			11
2.2.1 Central U.P. Plain Division	14,341	37			14,341				45
2.2.2 West U.P. Plain Division	22,230	33		3,059	10,464	8,707			40
2.3 Trans Gangetic Plains Sub-Region	49,946	24			2,482	41,239	6,125		11
2.3.1 Punjab Plain Division	17,554	26			1,649	11,831	4,074		29
2.3.2 PEPSU Division	6,428	19				5,622	806		N.A.
2.3.3 Delhi Division	370	22				370			28
2.3.4 East Rajasthan Plain Division	18,849	23				17,804	1,245		34
2.3.5 Madhya Bharat Lowland Division	5,223	28			933	4,290			36
2.3.6 Ajmer Division	1,522	20				1,522			26
3 The Desert Sub-Region	48,212	11				4,867	27,976	15,369	
3.1 Rajasthan Dry Area Division	48,212	11				4,867	27,976	15,369	13

*Exclude Andaman and Nicobar Island

Population and Land Use Table 11—*contd.*

Region, Sub-Region and Division	Total Area (in '000 ACRES)	Average annual rainfall (in INCHES)	Area (in '000 ACRES) having an annual average rainfall of						Average number of rainy days
			Above 75" (Blue bold)	Between 60-75" (Dark Green bold)	Between 30-60" (Green bold)	Between 15-30" (Light Brown bold)	Between 10-15" (Yellow bold)	Below 10" (Yellow bold)	
1	2	3	4	5	6	7	8	9	10
3 Peninsular Hills & Plateau Region	335,054	42	2,402	104,512	120,535	87,927			
3 1 North-West Hills Sub-Region	40,855	35			23,431	17,424			
3 11 Rajasthan Hills Division	7,726	30			2,496	5,230			34
3 12 Rajasthan Plateau Division	6,366	33			2,241	6,325			37
3 13 Madhya Bharat Plateau Division	17,380	37			14,350	3,230			42
3 14 Madhya Bharat Hills Division	6,983	33			4,344	2,639			44
3 2 North Central Hills & Plateau Sub-Region	53,678	44		23,104	39,593	981			
3 21 U P Hills and Plateau Division	10,077	36			9,626	451			43
3 22 Vindhya Pradesh Division	15,105	44		5,093	10,072				56
3 23 Bhopal Division	4,402	49			4,402				58
3 24 North-West Madhya Pradesh Division	14,094	48		8,071	25,493	530			58
3 3 North East Plateau Sub-Region	96,741	56		37,217	3,524				
3 31 Chhota Nagpur Division	21,221	54		15,252	5,970				70
3 32 East Madhya Pradesh Division	43,872	56		42,692	1,181				63
3 33 Orissa Inland Division	31,647	59		29,374	2,273				75
3 4 North Deccan Sub-Region	64,107	16	1,394	2,890	30,305	27,518			
3 41 South-West Madhya Pradesh Division	15,410	36		819	13,512	7,079			50
3 42 North Hyderabad Division	17,796	30			12,596	5,200			48
3 43 Bombay Deccan Northern Division	28,901	37	1,394	2,071	4,197	21,239			44
3 5 South Deccan Sub-Region	81,703	32	1,003	1,008	27,683	52,004			
3 51 South Hyderabad Division	34,716	33			19,716	15,000			31
3 52 Bombay Deccan Southern Division	11,155	29	353	353	1,909	8,540			50
3 53 Mysore Division	13,873	36	655	655	4,542	13,021			56
3 54 Madras Deccan Division	16,899	24			2,516	25,383			39
4 Western Ghats and Coastal Region	69,501	58	18,785	4,859	11,810	24,808	8,127		
4 1 Gujarat Kathiawar Sub-Region	46,623	33	431	2,023	20,533	24,708	8,127		
4 11 Bombay-Gujarat Division	21,103	36	431	1,723	10,533	8,316			44
4 12 Saurashtra Division	13,655	23				13,655			N.A.
4 13 Kutch Division	10,864	14				2,737	8,127		17
4 2 Malabar Konkan Sub-Region	23,879	207	29,357	3,216	2,086				
4 21 Greater Bombay Division	88	76	88						
4 22 Bombay Konkan Division	9,866	115	8,142	1,727	547				74
4 23 West Madras Division	6,958	129	6,486	472					95
4 24 Travancore-Cochin Division	5,852	94	4,134	97	739				121
4 25 Coorg Division	1,015	106	507	508					118

Population and Land Use Table 1.1—*concl.*

Regions, Sub-Regions & Divisions	Total area (in '000 acres)	Average annual rainfall in inches	Area (in '000 acres) having an annual average rainfall of						Average number of rainy days
			Above 75" (Blue belt)	Between 50—75" (Dark Green belt)	Between 30—50" (Light Green belt)	Between 15—30" (Brown belt)	Between 10—15" (Yellow belt)	Below 10" (Yellow belt)	
1	2	3	4	5	6	7	8	9	10
5 Eastern Ghats and Coastal Region	61,768	41		7,402	48,824	10,542			
5.1 North Madras and Orissa Coastal Sub-Region	29,258	45		6,446	19,304	3,548			
5.11 Orissa Coastal division	6,840	57		6,333	727				71
5.12 North Madras division	22,458	39		333	18,577	3,548			50
5.2 South Madras Sub-Region	35,470	37		956	27,520	6,994			49
5.21 South Madras division	35,470	37		956	27,520	6,994			49
Andaman and Nicobar Islands	2,653	123	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	177

Annexure I to Population and Land Use Table 1.1

Percentage of total area falling in different Rainfall Belts

	Above 75" (Blue Belt)	Between 50—70" (Dark Green Belt)	Between 30—50" (Light Green Belt)	Between 15—30" (Brown Belt)	Between 10—15" (Yellow Belt)	Below 10" (Yellow Belt)
1	2	3	4	5	6	7
India (1951 Census Area)	11	22	34	25	6	2
Himalayan Region	65	25	10	.		.
Northern Plains Region		15	30	29	18	8
Peninsular Hills and Plateau Region	1	31	39	29	...	..
Western Ghats and Coastal Region	28	7	17	36	12	
Eastern Ghats and Coastal Region		12	72	16		
Andaman and Nicobar Islands	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

Annexure II to Population and Land Use Table I I

Percentage of Area of Yellow and Brown Belts in various Sub-Regions to total land area of the Sub-Region and percentage of the area of the Belt falling in the Sub-Region to total area of the Belt in India

	Area in 000's of Acres	Percentage of total land of sub-Regions	Percentage of total area of the belt	Estimated Population of the area in the belt in 000's	Districts in the Belt
1	2	3	4	5	6
THE YELLOW BELT					
1 Desert Sub-Region (2 4)	57,597	40	100 0	7,300	
	43,545	90	75 3	3,900	{ Gangasagar, Bikaner, Churu, Jodhpur, Barmer, Jaisalmer, and parts of Jalore, Pali & Nagore (Rajasthan)
2 Gujarat Kathiawar Sub-Region (4 2)	8,127	18	14 1	600	Part of Kutch
3 Trans-Gangetic Plains Sub-Region (2 3)	6,125	13	10 6	2,800	{ Part of Patna and Hissar, (Punjab), Part of PEPSU Part of Sihar and Jhunjhunn (Rajasthan)
THE BROWN BELT					
(i) The Northern Brown Belt	127,990	39	100 0	88,300	
	97,016	36	82 1	66,200	
1 Desert Sub-Region (2 4)	4,867	10	2 6	1,000	Parts of Jalore, Pali, Nagore (Rajasthan)
2 Gujarat Kathiawar Sub-Region (4 2)	24,708	54	13 2	9,100	{ Whole of Saurashtra Anand and parts of Banaskantha, Sabarkantha, Mehsana, Ahmedabad, Kara (Bombay), Part of Kutch
3 Trans Gangetic Plains Sub-Region (2 3)	41,239	83	21 9	22,600	{ Parts of Ambala, Gurgaon, Hoshiarpur, Patna, Hissar; Whole of Amritsar, Jullundur, Ludhiana, Karnal, Rohitak, Gurgaon, (Punjab) Part of PEPSU, Delhi Part of Sihar and Jhunjhunn, Jaipur, Tonk, Sawai Madhopur, Bharatpur, Alwar, Bhilwara (Rajasthan) Bhind, Parts of Gwalior and Morena; (Madhya Bharat) Ajmer
4 North West Hills (3 2)	17,624	43	9 3	4,400	{ Parts of Udaipur, Gangasagar, Banswara, Sirohi, Kotah, Whole of Chittorgarh, Bundi, Jaipur (Rajasthan) Parts of Shajapur, Mandla, Ratlam, Dhar, Jabalpur, Nimar (Madhya Bharat)
5 Upper Gangetic Plain (2 2)	8,707	24	4 6	10,300	{ Bulandshahr, Aligarh, Mathura, Agra and parts of Saharanpur, Meerut, Meerut, Meerut, Etah, Etawah (U.P.)
6 North Central Hills and Plateau (3 2)	981	2	0 5	2,800	{ Part of Jabalpur (U.P.) Part of Nimar (Madhya Bharat)
(ii) The Central Brown Belt	71,523	33	42 3	31,000	{ Mahabubnagar, Raichur, and parts of Hyderabad, Gulbarga, Medak & Nalgonda (Hyderabad), Bellary, and parts of Bellary and Dharwar (Bombay) Tumkur, Mandya, Chitaldrug, and parts of Bangalore, Kolar, Mysore, Hassan, Channarayana, and Shimoga (Mysore) Bellary, Anantapur, Kurnool and parts of Cuddapah (Madhya)
1 South Deccan Sub-Region (3 5)	51,004	64	27 7	19,900	{ Parts of Amravati, Buldana, Akola (M.P.) Parts of Aurangabad, Bhur, Osmanabad (Hyderabad) Ahmednagar and Solapur and parts of West Khandesh, East Khandesh, Nashik, Poona, Satara North, Satara South, and Kolhapur (Bombay)
(iii) The Southern Brown Belt	16,812	18	6 8	7,100	
1 South Madras (3 2)	6,794	20	3 7	5,300	{ Parts of Chittoor, Salem, Coimbatore, Tiruchirappalli, Madurai, Ramanathapuram, Tirunelveli (Madras)
2 North Madras and Orissa Coastal (3 2)	9,548	12	12 9	1,800	Parts of Guntur, Nellore (Madras),

Annexure III to Population and Land Use Table 1*1

Periods of successive years of deficient rainfall*
During 1891-1920 and 1921-1950

Rainfall Division	Corresponding Natural Division	Number of years of deficient rainfall during thirty year period		Average deficiency during years of deficient rainfall		Number of periods of 2 or more successive years of deficient rainfall		Number of periods of 3 or more successive years of deficient rainfall	
		1891-1920	1921-1950	1891-1920	1921-1950	1891-1920	1921-1950	1891-1920	1921-1950
1	2	3	4	5	6	7	8	9	10
Assam	Assam Hills Assam Plains Manipur	4	2	16.5	12.0				
Bengal	Himalayan West Bengal West Bengal Plains Telpara	7	5	16.7	12.2	2			
Orissa	Orissa Inland Orissa Coastal	6	5	17.7	17.6	1	2		
Chhota Nagpur	Chhota Nagpur	6	5	19.8	12.0	1	1	1	
Bihar	North Bihar Plains South Bihar Plains	6	6	25.5	20.1		1		
Uttar Pradesh East	East Uttar Pradesh Plains Central Uttar Pradesh Plains Uttar Pradesh Hills and Plateaus	10	7	20.8	20.1	3	3		
Uttar Pradesh West	Himalayan Uttar Pradesh West Uttar Pradesh Plains	10	8	30.4	24.0		2		1
Punjab East & North	Himalayan Punjab Punjab Plains PEPSU Delhi	15	12	28.8	28.3	3	3	1	3
Rajputana West	{ East Rajasthan Plains Rajasthan Dry Area Rajasthan Hills Rajasthan Plateau Ajmer }	14	12	44.8	25.8	4	4	2	1
Rajputana East		13	8	21.4	21.0	2	2		"
Gujarat	Bombay Gujarat Saurashtra Kutch	9	8	45.7	29.4	1	1		1
Central India West	{ Vindhya Pradesh Madhya Bharat Bhopal }	11	5	23.0	17.6	1	1		1
Central India East		11	20	28.0	29.2	3	3		2
Berar		12	6	25.9	17.0	4	1	1	
Madhya Pradesh West	{ North-West Madhya Pradesh South-West Madhya Pradesh }	8	2	25.5	22.0				
Madhya Pradesh East	East Madhya Pradesh	6	4	20.7	19.8				
Konkan	Bombay Konkan Greater Bombay	9	3	26.7	20.0	1		1	"
Bombay Deccan	{ Bombay Deccan Northern Bombay Deccan Southern }	9	5	28.7	20.0	2	1		1
Hyderabad North	North Hyderabad	12	13	26.5	19.8	3	4	2	1
Hyderabad South	South Hyderabad	13	13	27.0	21.2	3	5	1	
Mysore	Mysore	10	8	21.4	20.1	1			
Malabar	Tirunelveli-Cochin West Madras	8	6	29.6	16.8	1	2	1	
Madras South East	South Madras	9	14	27.0	20.8	2	3	1	1
Madras Deccan	Madras Deccan	10	16	30.9	21.6		4		3
Madras Coast North	North Madras	6	8	22.3	17.8				"

*NOTE — The years in which the average annual rainfall was below the normal by 11% or more have been treated as years of deficiency

Population and Classification

Zone/Sub Region	Total land area according to the Surveyor General	Total Area for which village papers are available	Classification of area in		
			Area under forests	Area not available for cultivation	Other uncultivated land excluding fallow land
I	2	3	4	5	6
INDIA	812,570	623,416	93,385	99,572	102,665
I—North India	72,582	72,474	7,566	12,035	10,530
II—East India	167,460	120,855	18,082	17,639	29,755
III—South India	107,326	104,545	17,452	20,651	14,177
IV—West India	95,750	81,002	10,220	10,810	5,291
V—Central India	185,216	182,462	36,427	23,825	32,962
VI—North-West India	181,978	62,377	3,638	14,613	9,951
Andaman & Nicobar Islands	2,058	Not available			
SUB-REGIONS					
1*1 Western Himalayan	85,190	28,162	8,753	10,845	2,837
1*2 Eastern Himalayan	67,384	39,073	6,550	4,686	18,887
2 1 Lower Gangetic Plains	53,841	53,607	2,365	6,412	5,837
2 2 Upper Gangetic Plains	36,570	36,583	677	5,468	5,413
2 3 Trans-Gangetic Plains	50,585	38,136	1,810	6,092	5,291
2 4 The Desert	48,198	8,063	9	731	2,191
3 1 North West Hills	40,212	27,907	1,904	6,715	7,128
3 2 North Central Hills and Plateau	53,677	52,593	10,055	6,568	14,786
3 3 North East Plateau	95,195	77,130	23,949	8,192	18,012
3 4 North Deccan	62,088	61,622	7,455	6,331	1,595
3 5 South Deccan	81,735	80,621	12,348	14,627	5,301
4 1 Gujrat-Kathiswar	45,640	31,469	1,367	5,222	4,570
4 2 Malabar-Konkan	23,882	23,052	6,569	3,312	2,457
5 1 North Madras & Orissa Coastal	30,845	30,059	4,302	7,390	3,829
5 2 South Madras	35,469	35,337	5,470	6,979	4,531

NOTE — Figures in this table are taken from Census of India, Paper No. 2 of 1952 and no adjustment for non-reporting areas has been made.

Land Use Table 12

of land area

[FIGURES IN COLS 2—8 ARE IN THOUSANDS OF ACRES]

column 3		Area per 1000 acres of column 3 in Zone/Sub-Region			Area in Zone/Sub-Region per 1000 acres of total area in India for which 'village papers' are available		Uncultivated land excluding fallow land per 1000 acres of net area sown in Zone/Sub-Region
Fallow land	Net area sown	Under forests or otherwise not available for cultivation	Uncultivated land other than fallow land	Net area sown plus fallow land	Under forests or otherwise not available for cultivation	Uncultivated land other than fallow land	
7	8	9	10	11	12	13	14
59,365	268,429	310	164	526	1,000	1,000	382
2,644	39,300	272	146	582	102	103	268
9,069	46,411	295	246	459	185	290	641
11,851	40,414	364	136	500	197	138	351
9,319	45,363	260	65	675	109	51	117
20,332	68,917	330	181	489	312	321	478
6,150	28,025	293	159	548	95	97	355
Not available							
557	5,169	696	101	203	102	28	549
2,032	6,917	288	483	229	58	184	2,731
3,440	35,552	164	109	727	45	57	164
1,336	23,689	168	148	684	32	53	229
3,399	21,544	207	139	654	41	52	246
2,105	2,968	92	272	636	4	21	738
1,260	10,900	309	255	436	45	69	654
3,350	17,853	316	281	403	86	144	829
4,991	21,987	417	233	350	167	175	819
9,268	36,973	224	26	750	71	15	43
12,441	35,904	334	66	600	140	52	148
3,455	16,855	209	145	646	34	45	271
3,376	7,338	429	106	465	51	24	335
3,133	11,405	389	127	484	61	37	336
5,163	13,394	347	128	525	63	44	338

Annexure to Population

Classification of Land Area

(Estimates based on Census)

	Total Population (Estimates based on 1951 Census figures)	Land Area for which village papers are available	Classification Area under forests
1	2	3	4
The Yellow Belt.			
Tracts with Good Irrigation	5,200	9,702	14
Tracts with Fair Irrigation	2,100	7,206	125
TOTAL—Yellow Belt	7,300	16,908	139
The Brown Belt			
(i) Northern Brown Belt.			
Tracts with Good Irrigation	24,600	25,341	168
Tracts with Fair Irrigation	19,300	44,306	2,456
Tracts with Poor Irrigation	6,300	14,166	1,085
Northern Brown Belt	50,200	83,813	3,709
(ii) Central Brown Belt.			
Tracts with Good Irrigation	800	2,474	714
Tracts with Fair Irrigation	16,600	37,581	3,805
Tracts with Poor Irrigation	13,600	40,063	5,319
Central Brown Belt	31,000	80,118	9,838
(iii) Southern Brown Belt.			
Tracts with Good Irrigation	5,400	8,106	1,235
Tracts with Fair Irrigation	1,700	2,404	362
Southern Brown Belt	7,100	10,510	1,597
TOTAL—Brown Belt	88,300	174,441	15,144

Note —

Tracts with good irrigation—Where the percentage of irrigated area to the total area sown exceeds 20%

Tracts with fair irrigation—Where the percentage of irrigated area to the total area sown is between 5 and 20%

Tracts with poor irrigation—Where the percentage of irrigated area to the total area sown is less than 5%.

and Land Use Table 12

in Yellow and Brown Belts.

of India Paper No 2 of 1952)

[AREA FIGURES IN THOUSANDS OF ACRES]

of area in column 3

<i>Area not available for culti- vation</i>	<i>Other uncultivated land excluding fallow land</i>	<i>Fallow land</i>	<i>Net area sown</i>	<i>Area sown more than once</i>	<i>Gross area sown</i>	<i>Area irrigated</i>
5	6	7	8	9	10	11
825	2,271	2,365	4,227	185	4,412	1,483
1,325	1,298	1,532	2,926	381	3,307	412
2,150	3,569	3,897	7,453	566	7,719	1,895
3,330	3,343	2,351	16,149	3,285	19,434	8,091
9,254	6,897	3,852	21,847	2,571	24,418	2,297
3,119	2,375	806	6,781	380	7,161	208
15,703	12,615	7,009	44,777	6,216	50,993	10,596
322	493	256	639	55	744	181
7,403	1,653	5,759	18,961	510	19,471	1,904
3,634	1,452	4,395	25,263	515	25,778	829
11,359	3,598	10,410	44,913	1,080	45,993	2,914
1,655	1,112	1,418	2,686	444	3,130	914
282	209	261	1,290	153	1,443	258
1,937	1,321	1,679	3,976	597	4,573	1,172
28,999	17,534	19,098	93,666	7,893	101,559	14,682

Population and
Cropping

AREA SOWN TO									
Zone/Sub-Region	ALL FOOD GRAINS			RICE			WHEAT		
	Area in '000 acres	Area per 1000 acres of gross area sown in in	Area per 1000 acres in India	Area in '000 acres	Area per 1000 acres of gross area sown in in	Area per 1000 acres in India	Area in '000 acres	Area per 1000 acres of gross area sown in in	Area per 1000 acres in India
		sub-	in		sub-	in			
		region	sub-		region	sub-			
1	2	3	4	5	6	7	8	9	10
INDIA									
I—North India	237,211	779	1,000	69,800	219	1,000	24,254	80	1,000
II—East India	42,630	873	180	8,239	169	118	8,393	172	346
III—South India	48,570	868	205	33,217	594	476	1,757	31	72
IV—West India	31,764	694	134	12,493	273	179	15	.	1
V—Central India	33,220	709	140	3,182	68	46	2,301	49	95
VI—North-West India	55,827	754	235	11,581	156	166	6,127	83	253
Andaman & Nicobar Islands	25,199	765	106	1,088	33	15	5,661	172	233
				Not available					
Sub-Regions									
1-1 Western Himalayan	5,899	917	25	1,251	195	18	1,666	259	69
1-2 Eastern Himalayan	5,543	703	23	5,157	654	74	7	1	.
2-1 Lower Gangetic Plains	40,215	894	170	21,305	473	305	3,151	70	130
2-2 Upper Gangetic Plains	24,934	848	105	3,643	124	52	5,479	186	226
2-3 Trans-Gangetic Plains	18,980	745	80	401	16	6	4,192	165	173
2-4 The Desert	2,346	780	10	5	2		143	48	6
3-1 North West Hills	8,867	767	37	268	23	4	2,278	197	94
3-2 North Central Hills and Plateau	16,783	850	71	2,486	126	36	3,734	189	154
3-3 North East Plateau	23,484	903	99	14,866	571	213	405	16	17
3-4 North Deccan	25,725	683	108	766	20	11	1,540	41	63
3-5 South Deccan	23,845	701	109	2,779	75	40	725	20	30
4-1 Gujrat Kathiawar	11,543	660	49	1,126	64	16	928	53	38
4-2 Malabar Konkan	4,421	543	19	3,684	452	53	1	.	..
5-1 North Madras and Orissa Coastal	11,312	806	47	7,013	500	100	3	..	.
5-2 South Madras	11,315	724	48	5,050	323	72	2	..	.

*Figures in this table have been taken from Census of India Paper No. 2 of 1952 and no adjustments for non-reporting areas have been made

Land Use Table 1.3
Pattern*

AREA SOWN TO :											
BARLEY			Major millets - JOWAR, BAJRA, RAGI			ALL OTHER FOOD-GRAINS (small millets, maize, gram, pulses)			FOOD CROPS OTHER THAN FOOD-GRAINS		
Area in '000 acres	Area per 1000 acres of gross area sown in sub- region	Area per 1000 acres in India	Area in '000 acres	Area per 1000 acres of gross area sown in sub- region	Area per 1000 acres in India	Area in '000 acres	Area per 1000 acres of gross area sown in sub- region	Area per 1000 acres in India	Area in '000 acres	Area per 1000 acres of gross area sown in sub- region	Area per 1000 acre in India
11	12	13	14	15	16	17	18	19	20	21	22
7,772	25	1,000	62,264	205	1,000	73,121	240	1,000	1,3381	44	1,000
4,815	98	620	5,505	113	88	15,678	321	214	3,041	62	227
1,119	20	144	996	18	16	11,481	205	157	3,272	58	245
1			11,016	241	177	8,239	180	113	3,152	69	236
29	.	4	21,395	457	344	6,313	135	86	1,183	25	88
568	8	73	16,419	222	264	21,132	285	289	1,269	17	95
1,240	38	159	6,933	210	111	10,277	312	141	1,463	44	109
Not available											
451	70	58	586	91	9	1,945	302	27	162	25	12
2			7	1	.	370	47	5	800	101	60
2,620	58	337	574	13	9	12,566	279	172	2,824	63	211
2,695	92	347	4,035	137	65	9,081	309	124	2,039	69	152
975	38	126	5,377	211	86	8,035	315	170	1,243	49	93
102	34	13	1,284	426	21	812	270	11	43	14	3
88	8	11	3,422	296	55	2,810	243	38	268	23	20
653	33	84	2,424	123	39	7,486	379	102	270	14	20
144	6	19	1,051	40	17	7,019	270	96	459	18	35
10		1	16,604	441	267	6,806	181	93	387	24	66
11	.	1	13,426	364	216	8,905	242	122	1,152	31	86
20	1	3	7,158	410	115	2,312	132	32	420	24	31
1	..	.	274	34	4	461	57	6	1,454	179	109
1	..	.	2,101	150	34	2,193	156	30	693	49	52
..	..	.	3,941	252	63	2,341	148	32	667	43	50

Population and

Cropping

AREA SOWN TO						
Zone/Sub-Region	OIL SEEDS			FODDER CROPS		
	Area in '000 acres	Area per 1000 acres of gross area sown in sub-region	Area per 1000 acres in India	Area in '000 acres	Area per 1000 acres of gross area sown in sub-region	Area per 1000 acres in India
I	23	24	25	26	27	28
INDIA .	24,540	81	1,000	11,261	37	1,000
I—North India	816	17	33	1,850	38	164
II—East India	1,936	35	79	42	1	4
III—South India	6,921	151	282	683	15	61
IV—West India	4,294	92	175	4,493	96	399
V—Central India	9,074	122	370	888	12	79
VI—North West India	1,499	46	61	3,305	100	293
Andaman & Nicobar Islands	Not available					
SUB-REGIONS						
1 1 Western Himalayan .	186	29	8	61	10	5
1 2 Eastern Himalayan .	428	34	17	8	1	1
2 1 Lower Gangetic Plains	981	22	40	164	4	15
2 2 Upper Gangetic Plains .	394	14	16	1,676	57	149
2 3 Trans-Gangetic Plains .	1,125	44	46	3,042	119	270
2 4 The Desert .	236	78	10	146	49	13
3 1 North West Hills. . . .	950	82	39	109	9	10
3 2 North Central Hills and Plateau	1,641	83	67	716	36	64
3 3 North East Plateau . . .	1,751	67	71	76	3	7
3 4 North Deccan	4,569	121	186	1,941	52	172
3 5 South Deccan	6,308	171	257	422	11	37
4 1 Gujrat Kathiawar . . .	1,209	69	49	1,989	114	177
4 2 Malabar Konkan . . .	1,500	147	49	444	54	39
5 1 North Madras and Orissa Coastal.	5,137	81	46	260	19	23
5 2 South Madras	2,425	155	99	205	13	18

Land Use Table 1'3—concl'd.

Pattern

AREA SOWN TO											
COTTON			JUTE AND OTHER FIBRES EXCLUDING COTTON			TEA, COFFEE, TOBACCO AND OTHER MISCEL- LANEOUS CROPS			ALL CROPS		
Area in '000 acres	Area per 1000 acres of gross area sown in sub-region	Area per 1000 acres in India	Area in '000 acres	Area per 1000 acres of gross area sown in sub-region	Area per 1000 acres in India	Area in '000 acres	Area per 1000 acres of gross area sown in sub-region	Area per 1000 acres in India	Area in '000 acres	Area per 1000 acres of gross area sown in sub-region	Area per 1000 acres in India
29	30	31	32	33	34	35	36	37	38	39	40
11,947	39	1,000	2,049	7	1,000	3,980	13	1,000	304,369	1,000	1,000
148	3	12	223	5	109	111	2	28	48,820	1,000	160
80	1	7	984	18	480	1,041	19	261	55,926	1,000	184
1,637	36	137	204	4	100	1,440	31	362	45,802	1,000	151
2,997	64	251	86	2	42	544	12	137	46,817	1,000	154
6,414	87	537	501	7	244	100	1	25	74,073	1,000	243
670	20	56	51	2	25	743	23	187	32,930	1,000	108
Not available											
28	4	2	13	2	6	82	13	21	6,432	1,000	21
54	7	4	278	35	136	777	99	195	7,888	1,000	26
8		1	691	15	337	112	3	28	44,994	1,000	148
146	5	12	125	4	61	74	3	19	20,388	1,000	97
570	22	48	49	2	24	466	18	117	25,475	1,000	83
41	14	3	1			197	65	50	3,011	1,000	10
1,249	108	105	60	5	30	52	5	13	11,556	1,000	38
285	14	24	74	4	36	9		2	19,778	1,000	65
62	2	5	54	2	26	147	6	37	26,033	1,000	86
4,213	112	353	270	7	132	83	2	21	37,689	1,000	124
2,515	68	211	163	4	80	443	12	111	36,848	1,000	121
1,896	109	159	32	2	16	387	22	97	17,477	1,000	57
16	2	1	7	1	3	602	74	151	8,144	1,000	27
82	6	7	222	16	108	317	23	80	14,023	1,000	46
779	50	65	10	1	5	231	15	58	15,633	1,000	51

Annexure to Population

Cropping Pattern of Areas in

(Estimates based on Census)

AREA SOWN TO :					
	All food-grains	Rice	Wheat and barley	Major millets (Jowar, bajra and ragi)	All other foodgrains (Small millets, maize, gram and pulse)
1	2	3	4	5	6
The Yellow					
Tracts with Good Irrigation . . .	3,253	37	565	1,398	1,253
Tracts with Fair Irrigation . . .	2,671	5	238	1,289	1,739
The Yellow Belt	5,924	42	803	2,687	2,992
(i) Northern Brown Belt					
The Brown					
Tracts with Good Irrigation . . .	14,700	489	5,019	3,485	5,707
Tracts with Fair Irrigation . . .	18,360	162	2,883	10,531	4,784
Tracts with Poor Irrigation . . .	5,044	280	1,010	2,121	1,633
Northern Brown Belt	38,104	931	8,912	16,137	12,124
(ii) Central Brown Belt					
Tracts with Good Irrigation . . .	513	99	1	259	154
Tracts with Fair Irrigation . . .	14,583	1,149	312	9,672	3,450
Tracts with Poor Irrigation . . .	17,102	510	1,067	9,985	5,540
Central Brown Belt	32,198	1,758	1,380	19,916	9,144
(iii) Southern Brown Belt					
Tracts with Good Irrigation . . .	2,084	647	"	1,030	407
Tracts with Fair Irrigation . . .	975	262	"	400	313
Southern Brown Belt	3,059	909	"	1,430	720
THE BROWN BELTS	73,361	3,598	10,292	37,483	21,988

NOTE :—

Tracts with good irrigation.—Where the percentage of irrigated area to the total area sown exceeds 20%.

Tracts with fair irrigation.—Where the percentage of irrigated area to the total area sown is between 5% and 20%.

Tracts with poor irrigation.—Where the percentage of irrigated area to the total area sown is less than 5%.

and Land Use Table 1.3

Yellow and Brown Belts

of India Paper No. 2 of 1952)

[In thousand of acres

AREA SOWN TO :

Food crops other than foodgrains and oil seeds	Oil Seeds	Fodder Crops	Cotton	Jute and other fibres (excluding cotton)	Tea, Coffee, Tobacco and other miscellaneous crops	All Crops
7	8	9	10	11	12	13
Belt						
80	271	358	133	97	225	4,412
80	86	417	36	2	15	3,307
160	357	775	169	99	235	7,719
Belt						
1,045	463	2,376	463	26	361	19,434
1,446	1,959	1,069	1,156	42	386	24,418
81	650	397	900	30	39	7,141
2,672	3,078	3,842	3,519	88	786	60,993
Belt						
37	162	1	25	1	5	744
643	2,567	1,105	270	40	263	19,471
561	4,082	507	3,310	143	73	25,778
1,241	6,811	1,613	3,606	184	341	45,893
Belt						
126	304	100	279	173	64	3,130
60	121	52	21	122	92	1,443
186	425	152	300	296	156	4,573
3,999	10,308	5,607	6,424	577	1,283	101,559

Population and Cultivation and

Zone/Sub-Region	Statistical category	Land area according to the Surveyor General	Population (1951 Census) IN THOUSANDS
1	2	3	4
INDIA	ABC	633,032	332,787
	D	179,538	28,501
I—North India	ABC	72,582	63,216
	D		
II—East India	ABC	166,606	88,694
	D	854	1,437
III—South India	ABC	107,526	75,601
	D		
IV—West India	ABC	82,121	36,524
	D	13,629	4,137
V—Central India	ABC	164,930	49,072
	D	20,286	3,197
VI—North West India	ABC	39,267	19,681
	D	142,711	19,700
Andaman and Nicobar Islands		2,058	30
1 1 Western Himalayan	ABC	25,811	4,613
	D	59,379	4,410
1 2 Eastern Himalayan	ABC	66,530	11,043
	D	854	1,986
2 1 Lower Gangetic Plains	ABC	753,841	70,026
	D		50
2 2 Upper Gangetic Plains	ABC	36,370	38,901
	D		
2 3 Trans-Gangetic Plains	ABC	31,141	19,282
	D	19,444	6,585
2 4 The Desert	ABC		
	D	48,198	4,604
3 1 North West Hills	ABC	24,522	6,263
	D	15,690	4,101
3 2 North Central Hills and Plateau	ABC	53,581	13,789
	D	96	18
3 3 North East Plateau	ABC	75,005	25,860
	D	20,190	3,179
3 4 North Deccan	ABC	62,088	23,869
	D		
3 5 South Deccan	ABC	81,735	31,520
	D		
4 1 Gujarat Kathiawar	ABC	32,011	11,965
	D	13,629	4,137
4 2 Malabar Konkan	ABC	23,882	23,825
	D		
5 1 North Madras and Orissa Coastal	ABC	30,845	21,106
	D		
5 2 South Madras	ABC	35,469	30,726
	D		

Note —

- 1 The Scheme of categorisation is explained
- 2 Figures for "net area sown" given in given in Annexure II to the Introductory
- 3 Out of the total irrigated area of average of actual figures returned Sep

Land Use Table 1'4

acreage norms (1951)

[Figures in cols 3 and 5 to 7 are in thousands of acres]

		Net area sown			Area sown more than once		Area irrigated	
Net area sown	Area sown more than once	Area irrigated	Per 1000 acres of land area in Sub-Region/Zone	Per 1000 acres in India	Per 1000 acres of Net area Sown in Sub-Region/Zone	Per 1000 acres in India	Per 1000 acres of Gross area Sown in Sub-Region/Zone	Per 1000 acres in India
5	6	7	8	9	10	11	12	13
256,791	34,340	46,834	353	1000	132	1000	155	1000
29,894	3,363	3,457						
39,305	9,579	11,432						
			542	137	244	254	234	227
51,654	9,866	10,593	314	183	190	264	170	211
846	85	33						
40,358	5,464	11,829						
			375	141	135	145	258	235
43,095	1,304	2,085	523	175	32	42	48	49
7,006	297	375						
64,815	4,681	3,817						
4,249	444	80	373	241	74	136	53	78
17,564	3,446	7,078	194	123	169	159	243	200
17,793	2,537	2,969						
Not available								
2,920	971	485	61	18	245	34	197	25
2,258	296	786						
6,481	941	1,345						
846	85	33	109	26	140	27	165	27
35,553	9,931	9,847	660	124	279	264	216	196
23,694	5,725	7,228	648	83	242	152	246	144
18,295	2,899	6,944	488	86	190	124	278	162
6,368	1,785	1,216						
3,109	46	705	65	11	15	1	223	14
8,906	563	283						
6,058	410	262						
17,799	1,969	980	332	62	110	52	50	20
28								
23,049	3,473	3,309	286	95	144	104	108	67
4,221	444	80						
37,553	716	1,603						
			605	131	19	19	42	32
36,038	990	3,293	441	126	27	26	89	66
13,761	471	471	455	71	37	20	39	17
7,006	297	375						
7,420	815	1,016						
			311	26	110	22	123	20
11,929	2,633	4,789	387	42	221	70	329	95
13,394	2,240	5,246	378	47	167	59	336	104

in the Introductory Note

Tables 1'4, 1'5, 1'6, & 1'7, differ from those given in Col 8 of Table 1'2. A reconciliation of the two figures is

Note

3,457 thousand acres in category 'D' territories, only 738 thousand is estimated; the remaining 2,719 thousands be in Annexure to Table 1'4

Population and Cultivation

Zone, State and Division	1851 Census Popu- lation of Territories to which Cultivation Statistics relate		Net Area Sown Average—1815-30				Total			
	Population in thousands	Percentage to total popula- tion of the Unit	Statistical category A	Statistical category B	Statistical category C					
1	2	3	4	5	6	7				
Population Percentage of territories included in Statistical category.—										
	A	B	C	D*						
INDIA	54.2	28.7	9.3	7.3	332,757	92.1	155,462	53,134	42,195	236,792
I. North India	100.0				61,216	100.0	39,305			39,305
II. East India		97.8	0.7	1.5	81,664	98.5	57,267		31.0	57,654
III. South India	67.4	12.6			75,601	100.0	37,371			40,335
IV. West India	88.4		1.4	10.2	36,524	93.8	42,353		740	43,095
V. Central India	34.5		19.4	6.1	49,071	93.9	24,366		49,429	64,515
VI. North-West India	23.2	25.2	2.8	50.0	19,631	50.0	12,947	4,850	637	17,544
NORTH INDIA										
Uttar Pradesh					61,216	100.0	39,305			39,305
1 11 Himalayan Uttar Pradesh					2,422	100.0	1,504			1,504
2 14 East Uttar Pradesh Plain					15,887	100.0	9,475			9,475
3 21 Central Uttar Pradesh Plain					16,130	100.0	8,566			8,566
4 22 West Uttar Pradesh Plain					22,771	100.0	14,823			14,823
5 23 Uttar Pradesh Hills & Plateau					3,506	100.0	4,351			4,351
EAST INDIA										
Bihar					42,226	100.0		22,931		22,931
1 21 North Bihar Plain					18,373	100.0		9,491		9,491
2 22 South Bihar Plain					11,287	100.0		6,569		6,569
3 23 Chota Nagpur					10,566	100.0		6,870		6,870
Orissa					14,546	100.0		12,127		12,127
1 13 Orissa Inland					7,673	100.0		8,213		8,213
2 14 Orissa Coastal					6,873	100.0		3,913		3,913
West Bengal					24,139	97.3		10,995		10,995
1 25 Himalayan West Bengal					1,360	67.0		860		860
2 21 West Bengal Plain					22,779	100.0		10,065		10,065
Assam					9,044	100.0		5,234		5,234
1 21 Assam Plains					7,505	100.0		4,798		4,798
2 22 Assam Hills					1,538	100.0		436		436
Tripura (1 24)					639	100.0			347	347
SOUTH INDIA										
Madras					57,016	100.0	31,022			31,022
1 34 Madras Decan					5,998	100.0	7,421			7,421
2 33 West Madras					8,819	100.0	2,201			2,201
3 12 North Madras					14,433	100.0				14,433
4 21 South Madras					30,726	100.0	23,554			23,554
Mysore (3 53)					19,075	100.0	6,339			6,339
Travancore-Cochin (4 24)					9,270	100.0		2,825		2,825
Coorg (4 25)					223	100.0			162	162

*NOTE.—See inset to the Annexure on page 44

Land Use Table 1.5
per capita (1951)

[Figures in columns 4 to 19 are in thousands of acres]

Area Sown more than once Average—1946-50				Area Irrigated Average—1946-50				Area Irrigated more than once Average—1946-50				Area of cultivation per capita Average 1946- 50 (in acres)	Component of the area cultivation per capita			
Statistical category A	Statistical category B	Statistical category C	Total	Statistical category A	Statistical category B	Statistical category C	Total	Statistical category A	Statistical category B	Statistical category C	Total		Un- irri- gated single crop	Un- irri- gated double crop	Irr- igated single crop	Irr- igated double crop
8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
21,508	10,677	2,153	34,340	30,840	13,606	2,388	46,834	2,960	373	186	3,519	77	54	9	13	1
9,579			9,579	11,432			11,432	829			829	62	30	14	17	1
5,250	214		5,464	10,898	931		11,829	1,829	65		2,014	61	35	11	12	
1,281		21	1,302	2,016		69	2,085	250	185		2,090	53	33	4	13	2
3,013		1,608	4,621	1,638		2,179	3,817	27		165	182	118	109	3	8	1
2,385	667	394	3,446	4,976	2,062	140	7,078	35	123	21	179	89	37	16	35	2
9,579			9,579	11,432			11,432	829			829	61	30	14	17	1
3,000			3,000	172			372	32			32	72	54	12	6	1
1,010			3,020	3,428			3,428	45			45	53	17	17	19	
2,293			2,293	2,573			2,573	143			143	55	26	13	15	1
3,432			3,432	4,855			4,855	569			569	85	22	13	16	2
534			534	864			864	40			40	112	84	13	14	1
6,555			6,555		5,469		5,469					57	27	16	14	
3,091			3,091		882		882					32	30	17	5	
2,539			2,539		3,710		3,710					49	1	21	35	
905			905		868		868					63	47	8	8	
1,105			1,105		1,961		1,961		7		7	83	62	2	13	
234			234		1,053		1,053		5		5	105	57	3	13	
871			871		908		908		2		2	59	32	13	14	
1,311			1,311		1,988		1,988		58		58	45	32	5	8	
66			66		170		170					63	46	5	12	
1,265			1,265		1,818		1,818		58		58	44	31	5	8	
805			805		1,175		1,175					58	36	9	13	
692			692		1,044		1,044					60	38	9	13	
113			113		131		131					35	15	9	11	
		70	70									61	50	11		11
4,924			4,924	9,742			9,742	1,821			1,821	54	32	5	14	3
406			406	615			615	94			94	127	120	6	10	3
317			317	517			517					11	25	8	24	
1,762			1,762	3,881			3,881	353			353	44	10	10	24	2
2,240			2,240	5,246			5,246	1,373			1,373	44	14	3	13	4
326			326	1,136			1,136	7			7	70	54	4	12	
	213		213		915		915		185		185	30	20		2	2
	1		1		6		6					71	61		3	

Population and Cultivation

Zone, State and Division	1951 Census Population in which Cultivation Statistics relate		Net Area Sown Average - 1916-50			
	Population in thousands	Percent of total Population of the unit	Statistical category		Statistical category	
			A	B	C	Total
1	2	3	4	5	6	7
WEST INDIA						
Bombay	25,916	100.0	42,353			42,353
3 43 Bombay Deccan Northern	12,365	100.0	12,630			12,630
3 52 Bombay Deccan Southern	4,698	100.0	5,472			5,472
4 17 Bombay Gujarat	11,997	100.0	11,010			11,010
4 21 Greater Bombay	2,839	100.0	1			1
4 22 Bombay Konkan	4,657	100.0	2,215			2,215
Kutch (4 13)	568	100.0			742	742
CENTRAL INDIA						
Madhya Pradesh	19,051	85.0	24,386			24,386
3 24 North West Madhya Pradesh	5,472	99.7	7,805			7,805
3 30 East Madhya Pradesh	7,023	63.8	7,016			7,016
3 41 South West Madhya Pradesh	5,553	100.0	8,665			8,665
Madhya Bharat	7,954	100.0			10,712	10,712
3 35 Madhya Bharat Lowland	1,692	100.0			1,846	1,846
3 38 Madhya Bharat Plateau	4,616	100.0			6,284	6,284
3 44 Madhya Bharat Hills	1,646	100.0			2,682	2,682
Hyderabad	15,657	100.0			24,064	24,064
3 42 North Hyderabad	5,016	100.0			10,258	10,258
3 51 South Hyderabad	12,709	100.0			13,806	13,806
Madhya Pradesh (3 22)	3,573	100.0			4,061	4,061
Bhopal (3 13)	836	100.0			1,552	1,552
NORTH-WEST INDIA						
Punjab	12,641	100.0	12,047			12,047
1 13 Himalayas Punjab	532	100.0	470			470
2 37 Punjab Plains	11,659	100.0	11,568			11,568
Patiala & East Punjab States Union (2 32)	3,494	100.0		4,250		4,250
Almer (2 36)	693	100.0		414		414
Delhi (2 33)	1,744	100.0		217		217
Himachal Pradesh & Bilaspur (2 12)	1,109	100.0			637	637
SUB-REGIONS						
1 2 Western Himalayas (3 Divisions)	4,613	100.0	2,283		657	2,940
1 2 Eastern Himalayas (4 Divisions)	11,043	88.3		6,094	367	6,461
2 1 Lower Gangetic Plains (4 Divisions)	79,016	100.0	9,416	26,127		35,543
2 2 Upper Gangetic Plains (2 Divisions)	38,701	100.0	23,894			23,894
2 3 Trans-Gangetic Plains (4 Divisions)	15,762	74.5	11,368	4,581	1,846	18,295
3 1 North West Hills (2 Divisions)	6,262	60.4			3,906	3,906
3 2 North Central Hills and Plateau (4 Divisions)	13,789	769.9	12,186		5,613	17,800
3 3 North East Plateau (3 Divisions)	25,860	789.1	7,916	25,133		33,049
3 4 North Deccan (3 Divisions)	23,869	100.0	17,795		10,248	28,043
3 5 South Deccan (4 Divisions)	31,510	100.0	12,232		13,806	26,038
4 1 Gujarat-Kachhar (2 Divisions)	11,965	74.3	13,010		742	13,752
4 2 Malabar-Konkan (5 Divisions)	23,825	100.0	4,433	2,927		7,360
5 1 North Madras and Orissa Coastal (2 Divisions)	21,108	100.0	8,016	3,913		11,929
5 2 South Madras (1 Division)	130,716	100.0	13,394			13,394

Note.—Figures for Net Area Sown given in Tables 1, 4, 1, 5, 2-6 and 2, 7 differ from those given in col. 8 of Table 2. A reconciliation of

Land Use Table 1.5—concl'd.
per Capita (1951)

Area sown more than once Average—1916-50				Area Irrigated Average—1916-50				Area Irrigated more than once Average—1916-50				Area of culti- vation per capita Quinn- tation 1952 (In Cents)	Components of the Area of Cultivation per capita			
Statistical category	Statistical category	Statistical category	Total	Statistical category	Statistical category	Statistical category	Total	Statistical category	Statistical category	Statistical category	Total		Un- irrigated single crop	Un- irrigated double crop	Irrig- ated single crop	Irrig- ated double crop
A	B	C	11	A	B	C	15	A	B	C	19		20	21	22	23	24
1,251			1,251	2,016			2,016	250			250	178	109	3	6	1
584			584	1,233			1,233	210			210	151	138	3	6	2
165			165	375			375	15			15	180	107	3	6	
448			448	402			402	18			18	114	107	3	3	
84			84	60			60	7			7	48	45	2	1	
		23	23			69	69					139	114	4	12	
3,073			3,073	1,638			1,638	27			27	135	109	17	9	
589			589	589			589	147			147	143	138	11	2	
2,334			2,334	1,381			1,381	109			109	131	60	33	20	
90			90	109			109	1			1	156	131	2	2	
		687	687			462	462			30	30	135	121	8	6	
		134	134			179	179			5	5	129	92	7	10	
		339	339			226	226			23	23	136	124	7	4	
		224	224			55	55			2	2	159	141	14	3	
		135	135			1,483	1,483			135	135	129	127	1	7	1
		42	42			261	261					173	167	1	4	1
		93	93			1,227	1,227					109	98	1	10	
		788	788			196	196					114	86	22	1	
		56	56			33	33					185	174	7	4	
2,385			2,385	14,876			14,876	85			85	95	36	19	38	
277			277	173			173					49	3	26	18	
12,708			12,708	14,702			14,702	35			35	99	41	18	40	
	567		567	1,902			1,902	98			98	122	54	13	50	3
	47		47	704			704	25			25	60	41	3	12	1
	53		53	56			56					72	6	3	3	
		394	394			140	140			21	21	57	11	13	11	2
577		394	971	345		140	485	32		21	53	63	32	20	9	1
	871	70	941		1,345		1,345					59	38	9	12	
1,020	6,915		7,935	3,428	6,419		9,847	45	58		103	51	23	14	14	
5,725			5,725	7,226			7,226	711			711	61	29	13	17	1
12,708	667		13,375	4,702	2,063	179	6,544	35	123	5	163	95	45	14	35	1
		563	563			283	283			25	25	142	120	9	4	
		841	1,666			229	560			5	5	129	104	14	6	1
12,323			12,323	1,382			3,303	3				89	63	13	13	
12,334	1,139		13,473	1,342	1,912	261	1,603	513	5		517	257	2	8	1	
874		42	916	2,066		1,227	3,293	116		125	462	174				
897		93	990													
		23	471	402		60	471	18			18	115	107	4	4	1
468			815	65	651		1,016	7	185		192	31	24	3	3	
2,240	214															
1,762	371		2,033	1,884	408		4,780	325	2		357	57	23	11	21	2
			2,240	5,246			5,246	1,373			1,373	44	24	3	11	4

the two figures is given in Annexure II to the Introductory Note.

Annexure to Population and Estimate* of Cultivation per Capita (1951) in

D*		1951 Census population of the territories to which Cultivation Statistics relate	Area of Cultivated Land	Area of Land Sown more than once
Percentage of 1951 India Population of territories for which Cultivation Statistics are unavailable or unsatisfactory.		Population in '000s	Average 1946-50 (in thousands of acres)	Average 1946-50 (in thousand of acres)
Statistical gaps in West Bengal & Madhya Pradesh	1.07			
Chandernagore	0.01			
Mizoram	0.16			
Sikkim	0.04			
Saurashtra	1.35			
Rajasthan	4.23			
Jammu & Kashmir	7.22			
Andaman and Nicobar Islands	.			
Total	7.88			
1	2	3	4	5
INDIA	28,502	7.9	29,894	3,363
EAST INDIA	1,437	1.5	846	85
Gaps in Statistical Class B Territory of West Bengal	671	2.7	410	15
1.25 Himalayan West Bengal Division (Cooch Behar)	671	33.0	410	15
2.11 West Bengal Plains Division (Chandernagore)	50	100.0	..	.
1.33 Manipur	578	100.0	350	63
1.26 Sikkim	136	100.0	86	7
WEST INDIA	4,137	10.2	7,006	297
4.12 Saurashtra	4,137	100.0	7,006	297
CENTRAL INDIA	3,197	6.1	4,249	444
Gaps in Statistical Class A Territory of Madhya Pradesh	3,197	15.0	4,249	444
3.24 North West Madhya Pradesh Division	18	0.3	28	.
3.32 East Madhya Pradesh Division	3,179	31.2	4,221	444
NORTH-WEST INDIA	19,700	50.0	17,793	2,537
Rajasthan	15,299	100.0	15,535	[2,241]
2.34 East Rajasthan Plains Division	6,585	100.0	6,368	1,785
2.41 Rajasthan Dry Area Division	4,604	100.0	3,109	46
3.11 Rajasthan Hills Division	2,093	100.0	3,330	284
3.12 Rajasthan Plateau Division	2,008	100.0	2,728	126
1.14 Jammu & Kashmir	4,410	100.0	2,258	296
Andaman & Nicobar Islands	31	100.0	..	..

*Note —The basis for the estimates is explained in Annexure I to the Introductory Note.

Land Use Table 1.5

Statistical Category 'D' territories

<i>Area of Irrigated Land</i>	<i>Area of Land Irrigated more than once</i>	<i>Area of Cultivation Per Capita</i>	<i>Components of the Area of Cultivation Per Capita</i>			
			<i>Un-Irrigated single crop</i>	<i>Un-Irrigated double crop</i>	<i>Irrigated single crop</i>	<i>Irrigated double crop</i>
<i>Average 1946-50 (in thousands of acres)</i>	<i>Average 1946-50 (in thousands of acres)</i>	<i>Average 1946-50 (In cents)</i>				
6	7	8	9	10	11	12
3,457	157	105	81	11	12	1
33		59	51	6	2	.
16		61	57	2	2	...
16	..	61	57	2	2	
		...				
		61	50	11		.
17	.	61	45	5	12	...
375		169	153	7	9	.
375		169	153	7	9	..
80		133	116	14	3	..
80		133	116	14	3	.
.	.	156	156			
80		133	116	14	3	...
2,969	157	90	63	12	14	1
2,183	43	101	73	14	14	...
1,216	3	97	51	27	19	...
705	.	67	51	1	15	..
70		159	142	14	3	.
192	40	136	122	4	8	2
786	114	51	29	4	15	3
.

Population and Trend of cultivation per capita [FIGURES IN COLUMNS 6 TO

	Census Population of Territories to which Cultivation Statistics relate				Net area sown				Area sown more than once			
	(IN THOUSANDS)				Quantum preceding				Quantum preceding			
State and Division	1931	1941	1951	1961	1931	1941	1951	1961	1931	1941	1951	1961
1	2	3	4	5	6	7	8	9	10	11	12	13
STATISTICAL CATEGORY												
1 MADRAS	57,016	49,841	44,659	40,393	51,032	31,663	31,936	31,554	4,924	4,779	4,569	4,461
3 24 Madras Decan	5,038	4,486	4,047	3,669	7,421	7,506	7,643	7,234	406	377	346	304
4 21 West Madras	6,810	5,663	5,076	4,473	2,201	2,164	2,082	1,984	517	490	474	493
5 11 North Madras	14,433	11,725	11,404	9,968	8,016	8,023	8,128	7,784	1,761	1,697	1,654	1,656
5 21 South Madras	30,726	26,966	24,121	22,283	13,394	14,079	14,141	14,553	2,240	2,216	1,996	2,008
2 MYSORE	9,073	7,336	6,466	5,988	6,339	6,723	6,511	6,392	326	274	246	272
3 MADHYA PRADESH	13,051	16,814	15,506	13,013	24,366	24,401	24,936	24,374	3,013	2,875	2,842	2,167
3 24 North West Madhya Pradesh	5,472	5,164	4,718	4,310	7,805	8,108	8,077	7,962	389	502	439	401
3 22 East Madhya Pradesh	7,021	6,466	5,892	5,272	7,916	7,480	7,544	7,268	2,134	2,307	1,863	1,720
3 21 South West Madhya Pradesh	5,558	5,184	4,698	4,332	8,565	8,615	9,313	9,144	90	65	40	46
4 UTTAR PRADESH	63,216	55,021	45,409	45,378	39,305	34,170	34,749	35,296	9,979	8,585	8,018	8,613
1 11 Himalayan Uttar Pradesh	2,522	1,818	1,623	1,505	1,802	894	881	900	300	192	107	217
2 14 Part Uttar Pradesh Plains	17,887	15,378	13,920	12,979	9,476	8,963	8,765	8,668	3,020	3,059	2,677	2,770
2 21 Central Uttar Pradesh Plains	16,130	14,305	12,531	11,590	8,966	8,166	8,537	8,597	2,492	2,123	1,976	2,224
1 11 West Uttar Pradesh Plains	22,771	19,836	17,300	16,183	14,238	13,327	13,290	13,544	3,431	2,813	2,737	2,980
3 21 Uttar Pradesh Hills and Plateaus	3,906	3,423	3,033	2,789	4,821	3,021	3,530	3,626	534	417	422	442
5 PUNJAB	11,642	12,701	10,772	9,790	12,046	11,589	11,379	11,391	2,385	2,191	2,002	2,487
1 11 Himalayan Punjab	982	939	838	812	479	493	510	504	277	271	287	270
2 21 Punjab Plains	11,659	11,762	9,934	8,979	11,568	11,097	10,869	10,887	2,108	2,020	1,715	2,217
TOTAL 5 STATES												
	159,999	141,715	125,914	115,460	123,108	110,754	109,372	108,907	20,227	18,804	17,172	18,020
6 BOMBAY	33,896	10,603	17,679	15,078	42,353	28,546	27,810	26,612	1,281	992	734	788
3 43 Bombay Decan Northern	12,365	8,197	7,193	6,039	18,630	15,017	14,540	13,690	584	621	426	448
3 32 Bombay Decan Southern	4,698	3,402	3,049	2,767	6,472	7,029	7,040	6,777	161	71	72	60
4 11 Bombay Coast	11,397	4,093	3,148	2,659	13,019	4,402	4,233	4,177	446	138	152	181
4 22 Bombay Northern	4,057	3,416	3,116	2,759	3,211	2,009	1,761	1,969	84	77	84	83
4 11 Greater Bombay	2,639	1,655	1,303	1,194	14	29	37					
STATISTICAL CATEGORY												
1 TRAVANCORE-COCHIN	9,150	7,500	6,308	4,934	2,225	2,475	2,553	2,454	213	85	219	248
2 COCHIN	219	169	161	164	162	148	138	128	1	1	1	2
3 ASSAM	9,044	7,592	6,344	5,317	5,734	4,562	4,089	3,477	805	654	437	385
4 ARUNACHAL PRADESH	693	534	507	447	414	397	340	327	47	46	48	60
5 NORTHERN AND EAST PUNJAB	3,494	3,424	2,912	2,691	4,150	4,229	4,144	4,103	567	626	650	701
6 OISSA	14,816	13,763	12,491	11,559	12,217	11,805	12,397	12,974	1,105	738	672	771
7 DILH	1,744	1,118	616	418	216	202	205	196	53	52	45	69
TOTAL 7 STATES												
	27,410	33,656	29,821	25,237	25,228	23,925	23,869	23,677	2,791	2,202	2,019	2,234
6 BHILAR	40,216	36,125	31,556	29,177	22,981	22,914	20,561	21,125	6,555	4,822	5,235	5,661
9 WEST BENGAL	14,139	11,196	17,073	15,108	10,925	7,603	7,406	6,124	1,331	914	747	1,001

Land Use Table 1-6

during three decades— (1921-50)

IN ARE IN THOUSANDS OF ACRES]

Area Irrigated Quinquennium preceding				Area Irrigated more than once Quinquennium preceding				Area of cultivation Per Capita Quinquennium preceding (In acres)				Components of the Area of Cultivation Per Capita							
												Un-irrigated Single Crop	Un-irrigated Double Crop	Irrigated Single Crop	Irrigated Double Crop				
1951	1941	1931	1921	1951	1941	1931	1921	1951	1941	1931	1921	1951	1941	1931	1921	1951	1941	1931	1921
14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
'A' TERRITORIES																			
9,742	8,727	8,393	8,663	1,822	2,055	1,747	2,893	54	64	72	78	32	50	5	6	14	17	3	5
615	564	533	576	94	153	126	187	147	169	184	197	129	178	6	3	10	11	2	5
3,581	3,393	3,200	3,185	355	469	336	400	33	38	41	44	25	33	8	11				
5,246	4,770	4,660	4,901	1,373	7,433	2,284	1,305	44	52	59	65	24	40	3	3	13	16	4	6
1,136	1,139	1,093	985	7	10	28	29	70	92	99	105	54	85	4	4	12	16		
1,638	1,214	1,090	776	17	15	14	27	135	145	161	175	109	134	17	13	9	6		
147	137	100	58	13	13	11	14	143	157	171	185	130	174	11	9	2	2		
1,382	992	928	620	3	1	3	2	113	116	123	138	80	92	33	33	20	12		
109	85	62	68	1	1			156	170	190	211	152	208	2	1	2	2		
11,432	11,298	9,414	11,032	819	936	794	876	62	68	72	78	30	37	14	17	17	22	1	2
172	135	136	130	32	27	37	40	72	48	54	60	54	38	11	12	6	7	1	3
3,428	3,247	2,607	3,180	45	24	13	49	53	28	63	67	17	22	17	21	19	24		
2,573	2,779	2,252	2,926	142	120	141	127	55	60	66	72	25	29	13	15	15	24	1	1
4,653	4,536	4,040	4,417	569	740	591	630	65	70	77	84	32	42	13	15	18	23	2	4
604	501	378	359	40	16	11	10	112	114	116	130	84	102	13	15	14	13	1	
4,876	4,899	4,219	3,803	35	82	75	67	95	91	206	116	38	55	19	25	38	35		1
173	176	176	178					49	53	61	62	3	7	28	33	18	22		
4,702	4,722	4,043	3,325	35	82	75	67	99	94	109	121	41	60	18	24	40	36		1
28,824	27,777	24,210	24,959	2,709	3,098	2,646	2,882	71	78	87	91	42	60	21	13	16	19	2	2
2,016	1,125	1,013	995	280	178	126	133	118	137	156	166	109	156	8	4	5	5	1	1
1,232	761	647	694	70	158	111	116	151	184	202	226	138	230	3	5	8	9	2	2
315	193	187	157	15	10	10	9	180	207	231	241	171	236	3	2	6	5		
402	117	119	138	18	5	2	7	114	108	124	141	107	130	4	6	3	5		
60	53	60	66	7	5	3	1	46	59	62	68	45	63	2	3	1	2		
5	1																		
B' TERRITORIES																			
945	1,112	1,249	1,330	185	53	82	216	30	36	40	49	20	22		1	8	22	2	4
6	4	4	4					71	36	85	86	68	89		1	3	2		
1,175	466	386	272					68	64	63	65	36	53	9	7	13	5		
104	111	127	100	25	16	13	10	60	53	67	73	41	40	3	11	12	20	4	2
1,902	1,766	1,550	1,238	98	95	105	96	122	124	146	153	54	84	14	22	52	43	3	4
1,961	1,669	1,739	1,652	7	115	1	78	83	86	99	116	62	95	8	6	13	14		1
36	66	60	49					12	22	33	41	8	18	3	13	3	10		
6,149	5,184	5,034	4,645	315	279	181	400	65	70	81	94	43	68	6	7	15	17	1	2
5,469	4,712	4,667	4,105					57	52	63	73	27	39	16	20	14	14		
1,938	1,722	1,207	1,722	58	29	106	112	45	38	43	51	32	34	5	6	8	10		1

Population and Trend of Cultivation and Irrigation per capita

Year	Area under food-grains	Area under crops other than food- grains	Gross area sown	Area sown more than once	Net area sown
1	2	3	4	5	6
INDIA (8 WHOLE DIVISIONS AND PARTS OF 5 DIVISIONS)					
1891	79,786	19,083	98,869	9,904	88,965
1901	75,718	17,728	93,446	9,440	84,006
1911	80,335	20,969	101,304	9,768	91,536
1921	80,756	22,804	103,560	10,904	92,656
1931	N A	N A	104,679	10,401	94,278
1941	N A	N A	107,235	11,414	95,821
1951	86,440	25,142	111,582	12,489	99,093
NORTH INDIA (FOUR DIVISIONS OF U. P. Nos 2 14, 2 21, 3 21 & 2 22; TWO WHOLE DIVISIONS Nos 2 14 &					
1891	35,042	5,764	40,806	7,866	32,940
1901	33,370	5,022	38,392	7,115	31,277
1911	35,321	5,354	40,675	7,404	33,271
1921	36,590	5,386	41,976	8,256	33,680
1931	N A	N A	40,855	7,659	33,196
1941	N A	N A	42,786	8,219	34,567
1951	39,230	5,905	45,135	8,947	36,188
SOUTH INDIA (THREE DIVISIONS OF MADRAS Nos 3 54, 4 23 & 5 21 and MYSORE No 3 53, THREE WHOLE					
1891	16,034	3,822	19,856	1,302	18,554
1901	16,969	3,849	20,818	1,618	19,200
1911	17,421	4,570	21,991	1,637	20,354
1921	16,590	5,234	21,824	1,655	20,169
1931	N A	N A	22,597	1,720	20,877
1941	N A	N A	22,873	1,890	20,983
1951	15,842	6,660	22,502	2,105	20,397
WEST INDIA (THREE DIVISIONS OF BOMBAY Nos 3 52, 4 22 & 3 43, ONE WHOLE DIVISION No 3 52 AND TWO					
1891	17,443	4,203	21,646	444	21,202
1901	15,595	3,553	19,148	475	18,673
1911	16,241	4,661	20,902	451	20,451
1921	16,173	6,074	22,247	546	21,701
1931	N A	N A	23,356	543	22,813
1941	N A	N A	24,086	738	23,348
1951	19,396	7,400	26,796	758	26,038
CENTRAL INDIA (TWO WHOLE DIVISIONS OF MADHYA PRADESH Nos 3 24 & 3 41)					
1891	11,267	5,294	16,561	292	16,269
1901	9,784	5,304	15,088	232	14,856
1911	11,352	6,334	17,686	276	17,410
1921	11,443	6,110	17,553	447	17,106
1931	N A	N A	17,871	479	17,392
1941	N A	N A	17,490	567	16,923
1951	11,972	5,177	17,149	679	16,470

Land Use Table 1.7
during six decades (1891-1950) — India and Zones

[FIGURES IN COLUMNS 2 TO 7 ARE IN THOUSANDS OF ACRES]

Area irrigated	Census population (in 000's)	Area per capita (in cents)				Foodgrain cultivation percentage $\left[100 \times \frac{\text{Col. 2}}{\text{Col. 4}} \right]$
		Net area sown	Area under foodgrains	Gross area sown	Area Irrigated	
7	8	9	10	11	12	13
12,772	81,481	109	98	121	16	80.7
14,156	81,832	103	93	114	17	81.0
14,187	84,223	109	95	120	17	79.3
15,185	83,336	111	97	124	18	78.0
13,780	90,697	104	N.A.	115	15	N.A.
15,931	101,732	94	N.A.	105	16	N.A.
16,776	117,881	84	73	95	14	77.5
2 21 AND TWO PART DIVISIONS NOS 3 21 & 2 22)						
8,569	44,368	74	79	92	19	85.9
9,806	45,196	69	74	85	22	86.9
9,951	44,334	75	80	92	22	86.8
10,758	43,147	78	85	97	25	87.2
9,161	45,996	72	N.A.	89	20	N.A.
11,029	52,273	66	N.A.	82	21	N.A.
11,065	59,133	61	66	76	19	86.9
DIVISIONS NOS 3 54, 4 23 & 3 53 AND ONE PART DIVISION NO 5 21)						
3,370	18,246	102	88	109	18	80.8
3,388	18,889	102	90	110	18	81.5
3,408	20,177	101	86	109	17	79.2
3,452	20,976	96	79	104	16	76.0
3,591	22,954	91	N.A.	98	16	N.A.
3,691	25,469	82	N.A.	90	14	N.A.
3,974	29,985	68	53	75	13	70.4
PART DIVISIONS NOS 4 22 & 3 43)						
688	10,554	201	165	205	7	80.6
806	9,985	187	156	192	8	81.4
648	10,874	188	149	192	6	77.7
819	10,571	205	153	210	8	72.7
866	12,131	188	N.A.	193	7	N.A.
989	13,642	171	N.A.	177	7	N.A.
1,481	17,733	147	109	151	8	72.4
145	8,313	196	136	199	2	68.0
156	7,762	191	126	194	2	64.8
160	8,838	198	128	201	2	64.0
156	8,642	198	122	203	2	65.2
162	9,616	181	N.A.	186	2	N.A.
222	10,348	164	N.A.	169	2	N.A.
256	11,030	149	109	155	2	69.8

Population and
Trend of Cultivation and Irrigation per

Year	Area under foodgrains	Area under crops other than foodgrains	Gross area sown	Area sown more than once	Net area sown
1	2	3	4	5	6
3-54—Madras Deccan Division (WHOLE)					
1891	5,401	1,630	7,031	239	6,792
1901	5,635	1,486	7,121	345	6,776
1911	6,121	1,691	7,812	335	7,477
1921	5,471	2,067	7,538	304	7,234
1931	N.A.	N.A.	7,991	346	7,645
1941	N.A.	N.A.	7,973	377	7,596
1951	5,197	2,630	7,827	406	7,421
4-23—West Madras Division—(WHOLE)					
1891	1,229	492	1,721	356	1,365
1901	1,317	519	1,836	413	1,423
1911	1,507	739	2,246	463	1,783
1921	1,604	873	2,477	493	1,984
1931	N.A.	N.A.	2,556	474	2,082
1941	N.A.	N.A.	2,654	490	2,164
1951	1,619	1,099	2,718	517	2,201
5-21—South Madras Division (PART)					
1891	4,603	876	5,479	579	4,900
1901	4,716	841	5,557	624	4,933
1911	4,613	1,207	5,820	671	5,149
1921	4,102	1,143	5,245	586	4,659
1931	N.A.	N.A.	5,293	654	4,639
1941	N.A.	N.A.	5,243	749	4,494
1951	3,951	1,341	5,292	656	4,636
3-43—Bombay Deccan Northern Division (PART)					
1891	11,335	2,634	13,969	358	13,611
1901	9,955	2,280	12,235	365	11,870
1911	10,505	2,799	13,304	329	12,975
1921	10,507	2,631	13,138	448	13,690
1931	N.A.	N.A.	14,975	426	14,549
1941	N.A.	N.A.	15,678	621	15,057
1951	12,213	4,416	16,629	537	16,092
3-55—Bombay Deccan Southern Division (WHOLE)					
1891	5,064	1,485	6,549	76	6,473
1901	4,641	1,198	5,839	88	5,751
1911	4,744	1,780	6,524	78	6,446
1921	4,700	2,137	6,837	60	6,777
1931	N.A.	N.A.	7,112	72	7,040
1941	N.A.	N.A.	7,104	75	7,029
1951	6,080	2,557	8,637	165	8,472

Land Use Table 18—contd.

Capita during six decades (1891-1950)—Selected Divisions

Area per Capita (in cents)						Foodgrains cultivation percentage [100 X $\frac{\text{Col. 2}}{\text{Col. 4}}$]
Area irrigated	Census population (in 000's)	Net Area sown	Area under foodgrains	Gross area sown	Area irrigated	
7	8	9	10	11	12	13
616	3,699	184	146	190	17	76.8
586	3,633	187	155	196	16	79.1
577	3,761	199	163	208	15	78.4
576	3,669	197	149	205	16	72.6
533	4,047	189	N.A.	197	13	N.A.
564	4,486	169	N.A.	178	13	N.A.
615	5,033	147	103	155	12	66.4
39	3,809	36	32	45	1	71.4
39	4,044	35	33	45	1	71.7
	4,329	41	35	52		67.1
	4,473	44	36	55		64.8
	5,076	41	N.A.	50		N.A.
	5,663	38	N.A.	47	...	N.A.
	6,319	32	24	40	...	59.6
1,822	6,140	80	75	89	30	84.0
1,817	6,061	81	78	92	30	84.9
1,920	6,687	77	69	87	29	79.3
1,891	6,346	68	60	77	28	78.2
1,963	7,265	64	N.A.	73	27	N.A.
1,988	7,982	56	N.A.	66	25	N.A.
2,223	9,093	49	44	58	25	74.7
513	5,326	230	191	236	9	81.1
634	5,364	221	186	228	12	81.4
493	6,435	208	168	213	8	79.0
634	6,059	226	173	233	10	74.3
647	7,193	202	N.A.	208	9	N.A.
761	8,197	184	N.A.	191	9	N.A.
1,179	10,090	139	121	165	11	73.4
142	2,861	226	177	229	5	77.3
144	2,843	202	163	205	5	79.5
131	2,833	228	167	230	5	72.7
157	2,787	243	169	245	6	68.7
187	3,049	231	N.A.	233	6	N.A.
193	3,402	207	N.A.	209	6	N.A.
315	4,698	180	129	184	7	70.4

**Population and
Trend of Cultivation and Irrigation per**

Year	Area under foodgrains	Area under crops other than foodgrains	Gross area sown	Area sown more than once	Net area sown
1	2	3	4	5	6
4-33—Punjab & Keokhar Division (PART)					
1891	1,044	84	1,128	30	1,098
1892	999	75	1,074	22	1,052
1893	992	82	1,074	44	1,030
1894	976	306	1,272	38	1,234
1895	N.A.	N.A.	1,269	45	1,224
1896	N.A.	N.A.	1,304	42	1,262
1897	1,103	427	1,530	56	1,474
4-34—North West Provinces Division (WHOLE)					
1891	6,125	1,508	7,613	269	7,344
1892	4,615	2,315	6,733	206	6,527
1893	5,624	1,921	7,945	248	7,697
1894	6,595	1,858	8,363	401	7,962
1895	N.A.	N.A.	8,516	439	8,077
1896	N.A.	N.A.	8,610	502	8,108
1897	6,556	1,538	8,394	589	7,805
4-35—North West Provinces Division (WHOLE)					
1891	5,162	3,786	8,948	23	8,925
1892	5,166	3,189	8,355	26	8,329
1893	5,323	4,453	9,791	28	9,763
1894	4,039	4,252	8,190	46	8,144
1895	N.A.	N.A.	9,355	40	9,315
1896	N.A.	N.A.	8,880	65	8,815
1897	5,116	3,639	8,755	90	8,665

1891-1897 averages are averages of the quinquennium 1890-91 to 1894-95 for 1891; averages of the 5 years 1892-1896 for 1892-1896.

Land Use Table 1.8—concl'd.

Capita during six decades (1891-1950)—Selected Divisions

Area irrigated	Census population (in 000's)	Area per capita (in cents)				Foodgrains cultivation percentage Col 2 [$100 \times \frac{\text{Col 2}}{\text{Col 4}}$]
		Net Area sown	Area under foodgrains	Gross area sown	Area irrigated	
7	8	9	10	11	12	13
33	1,767	62	59	64	2	92.6
28	1,778	59	56	60	2	93.0
24	1,806	57	55	59	1	92.4
28	1,725	72	56	74	2	75.9
32	1,889	65	N.A.	67	2	N.A.
35	2,043	62	N.A.	64	2	N.A.
47	2,945	50	37	52	2	72.1
75	4,257	173	143	179	2	80.2
65	3,871	169	139	174	2	68.6
85	4,506	171	134	176	2	75.8
88	4,310	185	151	194	2	77.8
100	4,718	171	N.A.	181	2	N.A.
137	5,164	157	N.A.	167	3	N.A.
147	5,472	143	125	153	3	81.7
70	4,056	220	127	221	2	57.7
91	3,891	214	133	215	2	61.8
75	4,332	225	123	226	2	54.4
68	4,332	211	114	212	2	53.7
62	4,898	190	N.A.	191	1	N.A.
85	5,184	170	N.A.	171	2	N.A.
109	5,558	156	92	158	2	58.4

preceding quinquennium for 1901 and 1911, and for 1921-51 same as given in table 1.6 for whole divisions and State Census

Population and Land Use Table 1'9

Mineral Production of India by Sub-Regions

Mineral produced	Percentage to total India Production	Value (in 000 Rupees)
1	2	3

I—NORTH EAST PLATEAU SUB-REGION (3-3)

TOTAL VALUE OF ALL MINERALS 487,322 4

3 31 Chhota Nagpur Division

Coal	32.25	359035 2
Iron Ore	46 15	4883 6
Manganese	4 52	1467 5
Mica	56 45	60196 0
Copper	100 00	3865 0
Kyanite	95 83	1139 4
Chromite	12 60	90 5
Bauxite	44 33	159 1

TOTAL VALUE OF ALL MINERALS 435,836 3

3 32 East Madhya Pradesh Division

Coal	4 41	19250 4
Iron Ore	0 02	2 1
Manganese	46.37	15054 9

TOTAL VALUE OF ALL MINERALS 34,307 4

3 33 Orissa Inland Division

Coal	1.36	5936.6
Manganese	16 47	5347 3
Iron Ore	51.94	5496 3
Kyanite	0 37	4 4
Chromite	39 42	283.0
Graphite	65 47	111 1

* TOTAL VALUE OF ALL MINERALS 17,176 7

II—SOUTH DECCAN SUB-REGION (3 5)

TOTAL VALUE OF ALL MINERALS 69,795 9

3 51 South Hyderabad Division

Coal	3.64	15889 3
Gold	1.60	791.3

TOTAL VALUE OF ALL MINERALS 16,680 6

3 52 Bombay Deccan Southern Division

Bauxite	5.34	19.2
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TOTAL VALUE OF ALL MINERALS 19 2

Mineral produced	Percentage to total India Production	Value (in 000 Rupees)
1	2	3

3 53 Mysore Division

Iron	1 79	189 4
Manganese	0 29	94 1
Gold	98 40	48663.7
Mica	0 33	565 2
Magnasite	3.82	35 2
Kyanite	3 65	43 5
Chromite	38 41	275.8
Graphite	14 64	24 7

TOTAL VALUE OF ALL MINERALS 49,891 6

3 54 Madras Deccan Division

Manganese	9 87	3204 5
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TOTAL VALUE OF ALL MINERALS 3,204 5

III—NORTH CENTRAL HILLS & PLATEAU SUB-REGION (3 2)

TOTAL VALUE OF ALL MINERALS 30,604 9

3 21 Vindhya Pradesh Division

Coal	2.12	9254.2
Gypsum	0 17	0 1
Bauxite	0 79	2 9

TOTAL VALUE OF ALL MINERALS 9,257 2

3.24 North West Madhya Pradesh Division

Coal	4 75	20778 2
Manganese	1.15	373 4
Bauxite	45.38	162.9
Graphite	19.61	33.2

TOTAL VALUE OF ALL MINERALS 21,347 7

IV—EASTERN HIMALAYAN SUB-REGION (1 2)

TOTAL VALUE OF ALL MINERALS 19,883.2

1.21 Assam Plains

Coal	0 90	3928 6
Petroleum	100 00	14645.0

TOTAL VALUE OF ALL MINERALS 18,573.6

1.22 Assam Hills

Coal	0.3	1509.6
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TOTAL VALUE OF ALL MINERALS 1,309 6

Population and Land Use Table 1'9—*contd.*

Mineral Production of India by Sub-Regions

	1	2	3
V—NORTH WEST HILLS SUB-REGION (3.1)			
TOTAL VALUE OF ALL MINERALS			18,837 7

3 11 Rajasthan Hills Division			
Manganese	0 53	172 1	
Lead	100 00	831 0	
TOTAL VALUE OF ALL MINERALS			1,203 1

3 12 Rajasthan Plateau Division			
Mica	16 67	17776 2	
TOTAL VALUE OF ALL MINERALS			17,776 2

3 14 Madhya Bharat Hills Division			
Manganese	0 18	58 4	
TOTAL VALUE OF ALL MINERALS			58 4

VI—NORTH MADRAS & ORISSA COASTAL SUB-REGION (5 1)			
TOTAL VALUE OF ALL MINERALS			13,553 2

5 12 North Madras Division			
Manganese	2 41	782 5	
Mica	11 91	12700 3	
Kyanite	0 15	1 7	
Chromite	9 6	68 7	
TOTAL VALUE OF ALL MINERALS			13,553 2

VII—SOUTH MADRAS SUB-REGION (5 2)			
TOTAL VALUE OF ALL MINERALS			1,091 2

5 21 South Madras Division			
Manganese	96 18	884 8	
Gypsum	24 71	197 7	
Bauxite	2 43	8 7	
TOTAL VALUE OF ALL MINERALS			1,091 2

VIII—LOWER GANGETIC PLAINS SUB-REGION (2 1)			
TOTAL VALUE OF ALL MINERALS			10,162 4

2 13 South Bihar Plain Division			
Mica	9 53	10162 4	
TOTAL VALUE OF ALL MINERALS			10,162 4

IX—TRANS-GANGETIC PLAINS SUB-REGION (2 3)			
TOTAL VALUE OF ALL MINERALS			4692 0

2 36 Ajmer Division			
Mica	4 40	4692 0	
TOTAL VALUE OF ALL MINERALS			4,692 0

	1	2	3
X—NORTH DECCAN SUB-REGION (3 4)			
TOTAL VALUE OF ALL MINERALS			4,972 5

3 41 South West Madhya Pradesh Division			
Coal	0 08	349 2	
Manganese	14 24	4623 3	
TOTAL VALUE OF ALL MINERALS			4,972 5

XI—MALABAR KONKAN SUB-REGION (4 2)			
TOTAL VALUE OF ALL MINERALS			3,803 1

4 22 Bombay Konkan Division			
Iron	0 1	10 6	
Manganese	0 06	19 5	
Mica	0 16	170 6	
Bauxite	0 02	0 1	
TOTAL VALUE OF ALL MINERALS			200 8

4 24 Travancore-Cochin Division			
Mica	0 35	373 3	
Hematite	100 00	3229 0	
TOTAL VALUE OF ALL MINERALS			3,602 3

XII—THE DESERT SUB-REGION (2 4)			
TOTAL VALUE OF ALL MINERALS			1,351 6

2 41 Rajasthan Dry Area			
Coal	0 18	785 7	
Gypsum	70 74	565 9	
TOTAL VALUE OF ALL MINERALS			1,351 6

XIII—GUJRAT KATHIAWAR SUB-REGION (4 1)			
TOTAL VALUE OF ALL MINERALS			1,311 9

4 11 Bombay Gujrat Division			
Manganese	3 91	1269 5	
Bauxite	1 71	6 1	
TOTAL VALUE OF ALL MINERALS			1,275 6

4 12 Saurashtra Division			
Gypsum	4 44	35 5	
TOTAL VALUE OF ALL MINERALS			35 5

4 13 Kutch Division			
Gypsum	0 1	0 8	
TOTAL VALUE OF ALL MINERALS			0 8

Annexure I to Population and Land Use Table 1.9

Percentage distribution of (the quantity of) minerals produced by natural divisions

		Percentage			Percentage
<i>Coal</i>		100 00	<i>Manganese Ore</i>		100 00
1	Chhota Nagpur	82 25	1	East Madhya Pradesh	46 37
2	North-West Madhya Pradesh	4 76	2	Orissa Inland	16 47
3	East Madhya Pradesh	4 41	3	South-West Madhya Pradesh	14 24
4	South Hyderabad	3 64	4	Madras Deccan	9 87
5	Vindhya Pradesh	2 12	5	Chhota Nagpur	4 52
6	Orissa Inland	1 36	6	Bombay Gujarat	3 91
7	Assam Plains	0 90	7	North Madras	2 41
			8	North-West Madhya Pradesh	1 15
			9	Rajasthan Hills	0 53
	<i>Others (Assam Hills, Rajasthan Dry Area, and South-west Madhya Pradesh divisions)</i>	0 56	10	Madhya Bharat Hills	0 18
				<i>Others (Mysore and Bombay-Konkan divisions)</i>	0 35
<i>Mica</i>		100 00	<i>Petroleum</i>		100 00
1	Chhota Nagpur	56 45	1	Assam Plains Division	100 00
2	Rajasthan Plateau	16 67			
3	North Madras	11 91		<i>Iron ore</i>	100 00
4	South Bihar Plain	9 53			
	<i>Others (Ajmer, Mysore, Bombay-Konkan, and Travancore-Cochin divisions)</i>	5 44	1	Orissa Inland	51 94
			2	Chhota Nagpur	46 15
			3	Mysore	1 79
				<i>Others (East Madhya Pradesh and Bombay-Konkan divisions)</i>	0 12
<i>Gold</i>		100 00	<i>Copper Ore</i>		100 00
1	Mysore Division	98 40	1	Chhota Nagpur	100 00
2	South Hyderabad Division	1 60			

Annexure II to Population and Land Use Table 19

Mineral Production of India (Arranged by Value of Production)—(Five Year Average 1946-50).

Name of Mineral	Value in 000's of rupees of annual pro- duction	Percentage of total value of all minerals
1	2	3
I. Coal	436,517	58.86
II. (1) Mica	106,636	14.38
(2) Gold	49,455	6.67
(3) Manganese Ore	32,467	4.38
(4) Petroleum	14,645	1.97
(5) Iron Ore	10,582	1.43
(6) Copper Ore	8,865	1.20
(7) Other classified minerals :	8,215	1.11
(a) Ilmenite	3,229	0.44
(b) Kyanite	1,189	0.16
(c) Magnesite	920	0.12
(d) Lead	831	0.11
(e) Gypsum	800	0.11
(f) Chromite	718	0.10
(g) Bauxite	359	0.05
(h) Graphite	169	0.02
III. Others*	74,199	10.00
GRAND TOTAL	741,581	100.00

*Others include :

Metals : Silver (55)

Non-Metals : Salt (24368), Building materials (32383), Salt petre (2485), China Clay (1379), Steatite (508), Fire Clay (719), Other clays (692), Barytes (318), Diamond (292), Ochre (191), Emerald (139), Asbestos (69), Fuller's earth (66), Corundum (57), Feldspar (14), Apatite (14), Others : c. Zinc, Silimanite, Wolfram, Pyrite, Rutile and Vermiculite (45)

The figures in brackets indicate the annual value of production in thousands of rupees—five year average, 1946-50

Table 2 a—Yield per acre *of Foodgrains in India [Figures supplied by the Directorate of Economics and Statistics, Ministry of Food & Agriculture]

(Average for the quinquennium 1947-48 to 1951-52)

(IN LBS)						
Zone	(Clean) Rice	Jowar	Bajra	Wheat	All cereals	Cereals and grain
1	2	3	4	5	6	7
North India . .	533	497	467	700	606	598
East India . .	658	437	567	489	630	623
South India . .	890	482	461	241	675	674
West India . .	717	266	215	378	335	332
Central India . .	546	328	193	372	385	383
North-West India .	592	192	174	701	406	413
INDIA (Excluding Jammu & Kashmir)	666	339	258	576	514	508

*The yields per acre given in this statement have been obtained by dividing the official estimates of production by the corresponding acreage

Population and Land Use Table 2'1
Yield Rates of principal crops in India used by Dr. V.G. Panse in his special study
RICE

Year	Uttar Pradesh			Madhya Pradesh			Bombay			Madras		
	Area in '000 acres	Irrigation percentage	Average yield in lbs / acre—actual	Area in '000 acres	Irrigation percentage	Average yield in lbs / acre—actual	Area in '000 acres	Irrigation percentage	Average yield in lbs / acre—actual	Area in '000 acres	Irrigation percentage	Average yield in lbs / acre—actual
1	2	3	4	5	6	7	8	9	10	11	12	13
1910—11	.	.	.	4730	11 0	997	.	.	.	.	.	.
1911—12	5241	.	760	4822	9 2	1016	.	.	.	10289	.	846
1912—13	6779	.	660	4999	16.4	528	.	.	.	10944	.	908
1913—14	6140	.	461	4986	17.0	358	.	.	.	10678	.	878
1914—15	6166	.	740	4919	12.4	607	.	.	.	10876	.	875
1915—16	6398	.	805	5052	7 7	727	.	...	.	11230	...	908
1916—17	7105	.	847	5142	7 9	640	.	.	.	11655	.	1170
1917—18	7384	.	811	5171	7 0	673	.	.	.	10469	.	1059
1918—19	6697	.	479	5306	21.8	319	1709	N A	513	11646	.	899
1919—20	6540	6 5	771	5072	16 8	742	1931	8 5	1144	11096	73 6	1033
1920—21	6809	8 9	509	5126	19 8	310	1006	8.4	863	11280	70 5	1007
1921—22	6814	5 1	758	5071	18 7	709	1956	8 5	1058	11286	71 2	1039
1922—23	6983	4 4	675	5144	17 9	641	1886	7.2	1057	10518	70 9	1039
1923—24	6981	5 0	629	5171	18 3	656	1811	6 4	932	10870	70 0	965
1924—25	7072	4 1	721	5171	17 1	569	1887	8 7	1016	11323	69 6	1011
1925—26	7417	5 1	652	5198	21 3	622	1960	9 7	935	10842	71 2	1053
1926—27	7437	5 4	705	5280	16 0	699	1971	9 1	1071	10930	68 8	980
1927—28	7266	6 8	673	5411	17 9	647	2013	8 9	1047	11019	69.9	1042
1928—29	7024	10 7	352	5445	17 3	608	1953	9 6	1076	11262	70 3	1056
1929—30	6815	11 8	501	5480	16 4	730	1928	9.2	946	11678	71 3	1045
1930—31	6722	10.4	568	5541	17 6	568	1991	9.9	978	11538	72 6	1031
1931—32	6554	6 8	680	5528	14 7	718	1976	11 2	1024	11534	71 6	1045
1932—33	6140	9 6	484	5593	18 6	677	2027	10 9	1002	11704	71 1	1050
1933—34	5980	9 3	650	5638	16 7	659	2022	11 0	999	11056	71.7	1017
1934—35	6437	8 5	674	5691	15 3	704	2048	11.0	1043	9796	71 9	1009
1935—36	6626	9 1	659	5589	20 0	588	1972	8 5	958	9890	77.0	1084
1936—37	6641	5.9	693	5683	15 6	702	1831	7 5	857	10141	77 5	1086
1937—38	7032	8 0	645	5764	18 6	609	2037	10 2	975	2844	78.2	1071
1938—39	7663	7 0	585	5794	14 7	744	2015	8 5	877	9884	76.2	933
1939—40	7634	7 4	692	5896	19 6	552	1860	11 0	805	10744	77.9	1012
1940—41	7162	9.1	544	5873	27 0	420	1970	8.3	912	10212	78 6	1074
1941—42	6423	9 5	525	5757	22 6	347	1915	10.8	743	10382	78 2	1087
1942—43	6902	7 9	575	5654	24 5	725	2113	10 9	989	10925	77.7	996
1943—44	6977	9 0	580	5875	22 1	697	2005	11 5	985	11014	79 6	1021
1944—45	7034	9.9	469	6021	21 5	642	2063	12 8	896	10203	79 8	1028
1945—46	6914	9.7	573	6071	22 7	605	2093	11.2	879	10986	79.2	931

Population and Land Use Table 2.2

Yield Rates of principal crops in India used by Dr. V.G. Pause in his special study

WHEAT

Year	Punjab			Uttar Pradesh			Madhya Pradesh		
	Area in '000 acres	Irrigation in percent	Average yield in lbs/acre—actual	Area in '000 acres	Irrigation in percent	Average yield in lbs/acre—actual	Area in '000 acres	Irrigation in percent	Average yield in lbs/acre—actual
1	2	3	4	5	6	7	8	9	10
1910-11	.	.	.	7342	NA	891	3585	1.0	608
1911-12	.	.	3735	7572	"	897	3511	0.7	535
1912-13	.	.	3244	7378	"	892	3600	0.7	538
1913-14	.	.	2838	6377	"	760	3263	1.1	450
1914-15	.	.	3497	7295	"	934	3265	1.4	516
1915-16	.	.	3100	6599	"	917	3505	1.5	600
1916-17	.	.	3139	582	"	1014	3847	1.3	657
1917-18	.	.	3514	632	"	893	3884	1.6	435
1918-19	.	.	2485	766	67.2	948	2780	1.6	553
1919-20	.	.	2974	890	55.4	954	3199	1.4	597
1920-21	.	.	2663	49.9	548	6493	61.9	815	2.568
1921-22	.	.	2989	41.4	855	6809	52.6	879	2.448
1922-23	.	.	3272	38.1	765	6993	49.1	825	3008
1923-24	.	.	3327	37.1	854	7182	32.4	823	3277
1924-25	.	.	3383	33.8	601	7402	39.1	734	3306
1925-26	.	.	3131	43.1	735	6583	51.0	744	3514
1926-27	.	.	3163	42.2	746	6714	55.3	831	3734
1927-28	.	.	3151	45.4	738	7467	23.8	708	3664
1928-29	.	.	3638	41.6	562	7112	53.2	781	3184
1929-30	.	.	3205	47.7	885	7182	53.0	1032	2983
1930-31	.	.	3166	46.2	757	7611	45.9	791	3097
1931-32	.	.	3025	42.6	612	7748	47.5	755	3513
1932-33	.	.	2890	49.8	766	7667	46.8	793	3450
1933-34	.	.	3390	36.3	574	8453	45.1	672	3441
1934-35	.	.	3065	51.1	720	7549	52.3	749	3626
1935-36	.	.	3130	45.6	693	7053	51.0	793	3389
1936-37	.	.	3133	44.5	838	7484	44.4	758	3139
1937-38	.	.	3381	46.9	823	7810	54.6	798	3357
1938-39	.	.	3056	57.9	760	8372	57.4	707	3382
1939-40	.	.	2941	53.2	867	7961	57.3	676	3184
1940-41	.	.	3069	53.0	771	7787	53.8	797	3229
1941-42	.	.	3196	53.1	816	7724	60.5	741	2851
1942-43	.	.	3304	45.2	851	7397	53.7	797	2544
1943-44	.	.	3146	51.7	774	7524	53.6	736	2668
1944-45	.	.	3295	49.7	820	7744	53.4	750	2796
1945-46	.	.	3184	49.3	692	7908	55.1	638	2679
								2.0	365

Population and Land Use Table 2.3

Yield Rates of principal crops in India used by Dr V G Panse in his special study
JOWAR

Year	Uttar Pradesh			Madhya Pradesh			Bombay			Madras		
	Area in '000 acres	Irrigation percent-age	Average yield in lbs / acre—actual	Area in '000 acres	Irrigation percent-age	Average yield in lbs / acre—actual	Area in '000 acres	Irrigation percent-age	Average yield in lbs / acre—actual	Area in '000 acres	Irrigation percent-age	Average yield in lbs / acre—actual
1	2	3	4	5	6	7	8	9	10	11	12	13
1910—11	2468		487	4267		544						
1911—12	1633		487	3914		564						
1912—13	2169		618	3888		565				5220	NA	405
1913—14	2063		246	3920		525				5790	"	419
1914—15	2413		585	4299		664				5102	"	507
1915—16	2547		585	4956		744				5525	"	522
1916—17	2402		488	4188		471				4761	"	678
1917—18	1982		420	3820		438				4890	9 4	639
1918—19	1852		239	4652		315	7271		324	5070	10 5	593
1919—20	2330		540	4365		638	7803		529	5497	10 6	615
1920—21	2313		340	4492		250	8402		305	5221	10 4	609
1921—22	2684		540	4983		649	8041		440	5573	10 8	613
1922—23	2270		480	4527		599	8237		418	5256	11 9	613
1923—24	2479		540	4082		549	7447		342	4547	14 8	613
1924—25	2047		450	4167		514	8635		441	4944	11 1	636
1925—26	1990		447	3838		445	7819		414	4747	10 7	636
1926—27	2301		510	4159		466	7407		407	4692	10 5	578
1927—28	2446		510	4272		523	7220		528	4850	10 7	621
1928—29	2264		330	4169		596	7186		507	4614	10 6	662
1929—30	2469		583	4293		540	8667		424	5174	8 4	642
1930—31	2509		480	4716		561	8627		465	4762	8 3	600
1931—32	2619		450	4290		409	7412		476	4831	9 3	610
1932—33	2381		468	4251		498	7599		469	4535	9 0	638
1933—34	2632		420	4320		531	7761		441	4411	9 0	652
1934—35	2241		450	4334		497	7945		469	5143	10 1	556
1935—36	2237		450	4227		447	7843		449	5103	9 3	601
1936—37	2122		449	4658		488	9941		362	5121	8 5	569
1937—38	2232		436	4248		559	8073		334	4600	8 7	534
1938—39	2245		427	4331		480	7728		383	4913	10 6	577
1939—40	2307		528	4791		543	8042		347	5052	8 7	615
1940—41	2224		569	4533		536	8155		389	4668	8 8	636
1941—42	2129		413	4739		461	8477		329	4905	8 0	554
1942—43	2590		554	5307		475	7378		319	4849	9 6	508
1943—44	2380		504	5648		528	7586		395	4990	9 4	517
1944—45	2267		500	5185		461	8063		338	4645	9 6	579
1945—46	2546		496	5046		451	8800		243	4150	10 1	488

Population and Land Use Table 2.4

Yield Rates of principal crops in India used by Dr V G Panse in his special study

MAIZE

Year	Punjab			Uttar Pradesh		
	Area in '000 acres	Irrigation percentage	Average yield in lbs / acre—actual	Area in '000 acres	Irrigation percentage	Average yield in lbs / acre—actual
1	2	3	4	5	6	7
1910—11	.	.	.	2175	NA	935
1911—12	.	.	.	1791	"	879
1912—13	.	.	.	2205	"	935
1913—14	.	.	.	2136	"	756
1914—15	.	.	.	2376	"	990
1915—16	.	.	.	2619	"	990
1916—17	.	.	.	2416	"	880
1917—18	.	.	.	2321	"	990
1918—19	.	.	.	1882	"	605
1919—20	.	.	.	2430	7 1	935
1920—21	.	.	.	2094	15 1	673
1921—22	.	.	.	2075	3 6	880
1922—23	.	.	.	1873	4 7	715
1923—24	.	.	.	1835	8 5	935
1924—25	.	.	.	1550	2 8	770
1925—26	.	.	.	1612	3 2	770
1926—27	.	.	.	1679	4 8	881
1927—28	.	.	.	1862	5 9	935
1928—29	.	.	.	2004	23 7	770
1929—30	.	.	.	2327	13 3	880
1930—31	.	.	.	2375	14 1	880
1931—32	.	.	.	2116	10 1	882
1932—33	.	.	.	2137	11 9	787
1933—34	.	.	.	2023	7 9	770
1934—35	.	.	.	2121	4 4	841
1935—36	.	.	.	2120	8 2	854
1936—37	.	.	.	1965	5 4	612
1937—38	.	.	.	1948	21 5	860
1938—39	.	.	.	2054	14 5	677
1939—40	.	.	.	2098	20 3	911
1940—41	.	.	.	2111	13 4	883
1941—42	.	.	.	1920	16 7	709
1942—43	.	.	.	2424	5 0	874
1943—44	.	.	.	2495	4 8	837
1944—45	.	.	.	2424	14 6	883
1945—46	.	.	.	2536	7 9	852

Population and Land Use Table 2.5

Yield Rates of principal crops in India used by Dr V. G. Panse in his special study

COTTON

Year	Punjab				Madhya Pradesh				Madras			
	Area in '000 acres	Outturn in '000 tons	Average yield in lbs/acre	Irrigated percentage	Area in '000 acres	Outturn in '000 tons	Average yield in lbs/acre	Irrigated percentage	Area in '000 acres	Outturn in '000 tons	Average yield in lbs/acre	Irrigated percentage
1	2	3	4	5	6	7	8	9	10	11	12	13
1910-11					4487	810	72					NA
1911-12	413	69	67	71.2	4648	913	79		2676	308	46	"
1912-13	490	119	97	57.8	4494	853	74		2389	282	47	"
1913-14	780	204	105	56.0	4754	1004	84		2697	305	45	"
1914-15	597	170	114	58.3	4672	1027	88		2087	242	46	"
1915-16	268	71	106	58.2	3965	868	88		2060	243	47	"
1916-17	361	100	111	55.7	4489	753	67		2168	347	64	"
1917-18	564	96	40	48.8	4501	507	46		2700	504	75	"
1918-19	316	78	99	71.5	4135	807	78		3133	581	74	"
1919-20	547	191	140	71.3	4600	1289	112		2339	408	70	5.6
1920-21	550	151	110	67.5	4478	514	46		2150	358	67	6.3
1921-22	246	73	119	67.1	4414	1127	102		1803	341	76	7.4
1922-23	330	95	115	67.6	4857	1040	86		2348	431	73	7.4
1923-24	440	131	110	67.0	4933	1048	85		2658	483	73	8.9
1924-25	646	208	129	70.9	5247	1065	81		2903	507	78	9.6
1925-26	851	244	115	74.0	5385	932	69		2921	569	78	7.7
1926-27	701	164	94	77.3	4864	818	67		2231	388	70	8.3
1927-28	471	146	124	77.5	4796	1130	94		2123	447	84	8.8
1928-29	692	186	108	86.0	5078	1249	98		2495	528	85	9.5
1929-30	614	167	138	83.4	5175	1166	90		2507	513	82	8.4
1930-31	617	160	130	83.1	4750	1076	91		2071	381	74	6.7
1931-32	672	200	119	82.6	4620	506	44		2228	424	76	8.7
1932-33	522	182	139	79.5	4000	723	72		1970	413	84	10.9
1933-34	793	220	111	77.3	4270	733	69		2175	452	83	10.5
1934-35	673	227	135	77.7	4201	609	58		2320	476	82	12.4
1935-36	727	319	176	85.6	4068	654	64		2693	537	80	11.0
1936-37	756	355	188	82.9	3952	805	81		2512	497	79	10.9
1937-38	811	309	152	83.7	4047	727	72		2572	505	79	11.6
1938-39	722	215	119	87.3	3653	547	60		1940	372	77	8.6
1939-40	597	242	162	83.6	3270	736	90		2222	455	82	9.6
1940-41	572	272	190	81.8	3571	919	103		2441	534	88	12.2
1941-42	632	194	123	82.3	3805	1008	106		2556	564	88	12.6
1942-43	437	152	139	78.9	3273	551	67		2231	477	86	13.7
1943-44	471	170	148	80.5	3203	637	80		2210	485	88	12.5
1944-45	417	113	166	81.5	2803	475	68		1686	383	91	10.9
1945-46	372	142	153	83.9	2956	546	74		1623	362	89	15.1

Population and Land Use Table 2.6

Yield Rates of principal crops in India used by Dr V G Panse in his special study

SUGARCANE

Year	Punjab			Uttar Pradesh			Madras		
	Area in '000 acres	Irrigation per centage	Average yield in lbs / acre Actual	Area in '000 acres	Irrigation per centage	Average yield in lbs / acre Actual	Area in '000 acres	Irrigation per centage	Average yield in lbs / acre Actual
1	2	3	4	5	6	7	8	9	10
1910-11	...	...	...	1047	N.A.	2234	...	...	...
1911-12	167	62.9	1462	1341	..	2105	..	..	...
1912-13	228	68.7	1945	1424	..	2048	99	N.A.	3892
1913-14	243	70.0	1880	1389	..	1572	84	..	4188
1914-15	211	71.6	1953	1194	..	2051	74	..	4208
1915-16	188	72.9	2061	1261	..	2272	95	..	4386
1916-17	218	75.7	2076	1201	..	2087	114	..	5246
1917-18	264	72.3	2138	1484	..	2424	127	..	6403
1918-19	254	63.8	1385	1544	..	1433	123	..	5718
1919-20	266	71.4	2257	1414	73.6	2303	93	84.9	6286
1920-21	244	74.6	1708	1286	75.6	1750	103	81.6	5937
1921-22	179	77.7	1577	1152	74.0	2170	119	89.9	5929
1922-23	235	78.3	2057	1349	73.9	2220	131	94.7	6122
1923-24	253	74.3	2036	1544	72.1	2362	121	85.1	5924
1924-25	223	68.6	1838	1291	68.4	1827	110	97.3	6374
1925-26	217	68.2	1837	1419	69.4	2221	113	96.5	6244
1926-27	244	73.0	1689	1613	71.7	2325	114	97.4	5993
1927-28	249	73.9	1932	1585	73.3	2144	106	96.2	5980
1928-29	198	70.2	1674	1345	66.5	2067	89	95.5	6166
1929-30	140	71.4	1472	1349	76.6	2154	98	95.9	6286
1930-31	...	...	...	...	...	...	...	...	...
1931-32	200	74.5	1579	1488	74.7	2372	115	96.5	6253
1932-33	213	71.8	1832	1576	73.9	2125	116	96.6	6257
1933-34	268	71.0	1798	1773	72.4	3244	121	96.7	6276
1934-35	222	68.9	1756	1713	63.7	3663	122	95.9	6408
1935-36	228	71.1	1552	1813	63.5	3348	125	96.8	6290
1936-37	234	70.5	1723	2212	68.4	3376	121	94.4	6461
1937-38	269	72.9	2023	2465	66.6	3426	120	95.8	6309
1938-39	261	72.0	1502	2181	62.8	3218	98	93.9	6377
1939-40	165	67.9	2362	1628	66.2	2984	98	94.9	6283
1940-41	199	74.4	1683	1876	72.4	2541	138	93.9	6639
1941-42	263	74.0	1973	2518	67.4	2531	162	96.3	6706
1942-43	213	70.9	2051	1755	67.4	1967	109	93.6	6350
1943-44	218	68.8	2189	1865	72.9	3087	122	95.1	6004
1944-45	260	71.9	2369	2240	69.9	2853	125	95.5	6286
1945-46	286	69.6	2385	2166	63.9	2493	156	98.5	6605
1946-47	273	69.2	2385	1819	68.6	2738	161	95.0	6080

Tables 2.7 & 2.8

In crop cutting surveys, we* have sometimes to ignore districts which are minor in respect of the crop. This has resulted in the division-wise estimates being based in certain cases on a smaller number of districts than those included in the division. Normally, however, 90% of the area under the crop in each division is accounted for by the estimates, except in a few instances indicated in the marginal remarks. The official estimates shown in the statement, refer to the final forecasts issued by the State Governments and may, therefore, slightly differ from the estimates published in the Seasonal & Crop Report which gives only the revised estimates of area and production. In certain states, particularly Bihar and Orissa, the official estimates are not shown in the statements (Tables 2.7 and 2.8) for the first four years. This is because individual district estimates were not supplied in the official forecast. For subsequent years, we have filled in the gap with the information which we have specifically obtained from the states.

All estimates in the statements relate to grains after they are dried after harvesting.

[Also see Notes at the end of each table].

* This is an extract from a letter from the Indian Council of Agricultural Research to the Registrar General, India.

Population and Land

Estimates of average yield of RICE in lbs per acre for the various Natural Divisions of the officially estimated.

State and Natural Division 1	1944-45		1945-46		1946-47	
	Survey 2	Official 3	Survey 4	Official 5	Survey 6	Official 7
1 Uttar Pradesh						
Himalayan U. P.	.	.	.	.	.	.
East U. P. Plain	.	.	499	498	492	469
Central U. P. Plain	.	.	549	N.A.	449	N.A.
Western U. P. Plain	.	.	600	N.A.	546	N.A.
U. P. Hills & Plateau	.	.	484	N.A.	754	N.A.
2 (a) Bihar (Autumn Rice)						
North Bihar Plain	.	.	.	.	520	N.A.
South Bihar Plain	..	..	.	.	333*	N.A.
Chhota Nagpur	.	.	345	N.A.	389	N.A.
(b) Bihar (Winter Rice)						
North Bihar Plain	.	.	628	N.A.	599	N.A.
South Bihar Plain	.	.	596	N.A.	632	N.A.
Chhota Nagpur	.	.	897	N.A.	914	N.A.
3 Orissa Coastal (Autumn Rice)						
(Winter Rice)	713	N.A.	420	N.A.	370	N.A.
4 Assam Plains (Winter Rice)	.	.	765	N.A.	685	N.A.
5 Madras						
Madras Decan	.	..	.	.	866	960
West Madras	.	.	.	..	1,005	1,076
North Madras	.	.	1,033	964	N.A.	N.A.
South Madras	.	..	.	.	.	.
6 Bombay						
Bombay Decan Northern	.	.	695	727	738	681
Bombay Decan Southern	.	.	746	502	808	853
Bombay Gujarat	.	.	749	872	830	884
Bombay Konkan	.	.	1,122	1,032	1,068	985
Greater Bombay	.	.	.	..	.	.
7. Madhya Pradesh						
North West Madhya Pradesh	.	.	525	556	515	487
South West Madhya Pradesh	.	.	.	.	.	.
East Madhya Pradesh	.	.	693	667	696	561
8 Coorg	..	..	..	.	1,136	1,042

Notes:—

(1) Uttar Pradesh: (i) The survey estimate for 1947-48 (West U. P. division) represents approximately 73% of the and have therefore been excluded for the year. The Official estimate for the year, however, refers to the entire division.

(ii) For the years 1945-46, 1946-47, and 1950-51, official estimates have not been given against some of the divisions as less than 90%.

(3) Bihar: (i) Autumn Rice estimates for the South Bihar division for years preceding 1950-51 represent about 80% For 50-51, however, the estimate for the whole state has been used in the case of the districts not covered by the survey. namely

(ii) District-wise estimates are not available for 1948-49 (autumn rice) and so the division wise estimates could not be (autumn) is less than 10% of the area in the division.

(iii) In the case of Monghyr district (winter rice) the area was split half and half between Monghyr North and Monghyr (winter) . As the Surveys were confined mostly to only one district (Sambalpur) of the Inland division, estimates

(4) Assam: Figures refer to the tract excluding Goalpara where the Surveys were not conducted during these years.

(5) Madras: (i) No experiments in Decan Division.

(ii) The Survey of 1946-47 covered only seven districts five forming the North division and two of the South division.

(iii) For 1946-47 the Survey covered six districts only in the South division accounting for about 60% of the rice area

(iv) During the next three years Coimbatore and Salem districts alone were not covered by the Survey. But the

(v) Bombay: Konkan division includes Bombay Suburban district and these area separate estimates for the Greater

(vi) Madhya Pradesh: (i) The North West division figures represent about 75% of the area under rice in the division

(ii) No estimates in the South-West division.

Use Table 2.7

Indian Union as obtained by crop-cutting surveys by the random sampling method and as

1947-48		1948-49		1949-50		1950-51	
Survey 8	Official 9	Survey 10	Official 11	Survey 12	Official 13	Survey 14	Official 15
528	433	625	533	465	510	380	343
590	604	607	669	501	651	461	N.A.
549*	603	545	641	501	643	495	N.A.
526	614	608	620	418	624	413	N.A.
515	N.A.	N.A.	N.A.	485	485	456	456
367**	N.A.	N.A.	N.A.	436**	436**	361	361
378	N.A.	374	532	374	374	316	316
644	N.A.	573	652	552	552	327	327
508	N.A.	596	557	532	532	290	290
864	N.A.	773	696	763	763	591	591
298	N.A.			441	374		
652	N.A.	702	546	656	429	722	427
1001	985	990	986	927	997	829	765
745	800	839	998	778	887	760	921
1,046	1,082	1,075	1,089	827	844	1,002	1,029
923	783	913	854	849	844	1,016	859
499	759	611	659	537	779	532	546
935	763	844	642	769	685	940	923
613	745	367	461	576	771	478	500
1,009	1,003	1,080	893	959	890	957	959
579	590	542	521	617	562	307	314
725	680	656	604	811	733	545	428
984	846	1,356	1,112	1,145	906	1,221	1,050

area under rice in the division. Separate estimates for the districts Bijnor, Moradabad and Farrukhabad are not available. Separate estimates are not available for a few of the constituent districts thereby rendering the percentage area covered only of the area under autumn rice in the division as the surveys were confined to the two districts of Shahbad and Bhagalpur all except Shahbad given. For Chhota Nagpur, however, the pooled estimate is available excluding Santal Parganas where the area under rice South while the same average yield represented the two halves have not been given for the division.

in the division. As such estimates have not been given total area covered in the South division was more than 90% Bombay division as such.

the surveys covering only the districts of Sagar (Damoh Tehsil only), Jabbalpur, Mandla and Chhindwara (Seoni Tehsil only)

Population and
Estimates of average yield of wheat

<i>State and Natural Division</i>	<i>1943-44</i>		<i>1944-45</i>		<i>1945-46</i>		<i>1946-47</i>	
	<i>Survey</i>	<i>Official</i>	<i>Survey</i>	<i>Official</i>	<i>Survey</i>	<i>Official</i>	<i>Survey</i>	<i>Official</i>
1	2	3	4	5	6	7	8	9
Uttar Pradesh								
Himalayan U P			646	940	499	737	516	786
East U P Plain		..	784	876	706	676	725	753
Central U P Plain]			671	723	774	692	702	696
West U P Plain			673	750	583	616	612	643
U P Hills & Plateau			542	570	634	513	504	445
Bihar								
North Bihar Plain					501	N A	512	N A
South Bihar Plain					404	N A	456	N A
Chhota Nagpur								
Bombay								
Bombay Deccan Northern	..				398	413	28	136
Bombay Deccan Southern					146	150	21	29
Gujarat					376	409	279	152
Bombay Konkan & Greater Bombay		..					..
Madhya Pradesh								
North-West M P.	..		430	447	417	373	103	118
East M. P.			271	353	372	356	125	141
South-West M P.			340	361	448	346	26	38
Punjab								
Himalayan Punjab	566	504	637	504	633	388		
Punjab Plain	929	840	904	866	877	717		
Ajmer							536	656
Delhi							626	491

NOTE.—(1) Palamu district of Chhota Nagpur division in Bihar was alone covered by the Survey
(2) No experiments in Konkan and Greater Bombay where wheat area is nil

Land Use Table 2.8

in lbs. per acre for the various natural divisions.

1947-48		1948-49		1949-50		1950-51	
Survey	Official	Survey	Official	Survey	Official	Survey	Official
10	11	12	13	14	15	16	17
448	852	398	666	666	1000	754	755
662	741	431	490	673	758	731	666
732	763	578	603	621	600	866	746
663	793	610	689	783	756	826	756
571	580	624	546	674	500	666	687
		1					
692	N A	589	N A	506	506	381	381
511	N A	448	N A	458	458	418	418
			17		1.	.	.
			17				
332	493	319	399	406	482	371	338
170	179	59	112	192	205	208	218
394	369	265	365	377	388	541	533
..
365	376	613	560	503	487	651	632
259	295	384	393	365	367	339	362
275	258	335	346	337	334	427	372
597	532	521	512	630	551	597	575
789	752	892	818	1024	947	915	831
647	533	717	717	512	379	793	459
719	452	715	513	838	526	245	560

Population and
Classification of land area population, and land area

								Land
Agricultural Area								
Irrigated World Population Divisions	Total (in '000 sq miles)	Arable land (including fallow & orchards)		Permanent meadows & pastures		Forest and woodlands		
		in '000 sq miles	per '000 sq miles of land area	in '000 sq miles	per '000 sq miles of land area	in '000 sq miles	per '000 sq miles of land area	
1	2	3	4	5	6	7	8	
INDIA . . .	1,270	546	430	..	.	145	115	
Ugasia								
1. Europe . . .	1,903	568	298	370	194	494	260	
2. U. S. S. R. . .	9,225	869	94	479	52	3,552	385	
3. East Asia . . .	3,863	392	101	751	194	482	125	
4. South East Asia . .	1,728	163	94	4	2	995	576	
5. South Central Asia .	1,687	615	365	..	..	174	103	
6. South West Asia . .	2,320	154	66	238	103	233	57	
Africa								
7. Africa . . .	11,745	722	62	2,236	190	3,544	302	
Americas								
8. North America . .	7,139	851	119	1,205	169	2,506	351	
9. South & Central America . . .	7,874	326	41	1,731	220	3,310	421	
Oceania								
10. Oceania . . .	3,304	73	22	1,421	430	294	89	
World Total . . .	50,793	4,733	93	8,435	166	15,484	305	
Selected Countries								
1. China . . .	3,646	351	96	750	206	324	89	
2. U. S. S. R. . .	9,225	869	94	479	52	3,552	385	
3. U. S. A. . . .	2,977	711	239	1,034	347	975	328	
4. Japan	141	23	163	2	14	96	681	
5. Indonesia . . .	735	42	57	..	..	467	635	
6. Pakistan . . .	377	80	212	..	..	12	32	
7. Germany . . .	92	33	359	21	228	27	293	
8. United Kingdom .	93	29	312	47	505	6	65	
9. Brazil	3,268	73	22	512	157	1,528	468	
10. Italy	114	60	526	20	175	23	202	
11. France	213	82	385	47	221	43	202	

Land Use Table 3.0

per capita in ten population divisions of the World and 12 countries

Area		Land Area (in acres) per Capita (in cents)					
		Agricultural area					
Other land area							
in '000 sq. miles	per '000 sq. miles of land area	Latest estimated number (in thousands)	Total	Arable land (including fallow & orchards)	Permanent meadows & pastures	Forests and woodlands	Other land area
9	10	11	12	13	14	15	16
578	455	361,239	225	97		26	102
471	248	396,388	307	92	60	79	76
4,325	469	193,900	3,045	287	158	1,172	1,429
2,243	580	579,934	427	43	83	153	248
566	328	163,603	676	64	2	389	221
898	532	452,877	239	87		25	127
1,795	774	74,849	1,984	132	203	114	1,535
5,243	446	197,984	3,797	233	723	1,146	1,695
2,577	361	165,728	2,757	329	465	968	995
2,507	318	161,860	3,113	129	684	1,309	991
1,516	459	12,910	16,379	362	7,045	1,457	7,515
22,141	436	2,400,033	1,354	126	225	413	590
2,221	609	463,500	503	48	103	45	307
4,325	469	193,900	3,045	287	158	1,172	1,429
257	86	150,697	1,264	302	439	414	109
20	142	83,200	109	18	2	74	15
226	308	73,500	640	37		406	197
285	756	75,842	318	68		10	240
11	120	47,695	123	44	28	36	15
11	118	50,212	119	37	60	8	14
1,155	353	52,645	3,973	89	622	1,858	1,424
11	97	46,728	196	82	27	32	15
41	192	42,300	322	124	71	65	62

Population and Land Use Table 3.1

Comparison — India, the World, Europe & Asia
and Africa, Americas and Oceania

		India	World	Europe, Africa, Americas & Asia and Oceania	
	1	2	3	4	5
A—	Population (in crores)	36	240	186	54
	Land Area (in crores of acres)	81	3251	1327	1924
	Land Area Per Capita (in cents)	225	1354	713	3573
	Topographically Usable Area Per Capita (in cents)	151	921	421	2672
	Arable Farm Land Per Capita (in cents)	97	126	95	234
B—	Percentage of total Land Area which is topographically Usable	67	68	59	75
	Percentage Total Land Area which is used for Arable Farming	43	9	13	7
	Percentage of topographically usable area which is used for Arable Farming	65	14	23	9
C—	Irrigation Percentage	14	8	10	4

Population and Land Use Table 3.2

Irrigation in the World, the Continents, India and the six zones

Territory	Area adapted to agricultural production (In lakhs of acres)	Irrigated area (In lakhs of acres)	Percentage of irrigated area to area adapted to agricultural production
1	2	3	4
THE WORLD			
(excluding Antarctica)*	25,800	2,085	7.8
Asia	6,000	1,408	23.5
Europe	8,900	148	1.7
North America	5,700	268	4.7
Africa	2,400	103	4.3
South America	2,200	66	3.0
Oceania	600	12	2.0
INDIA	3,278††	468	14.3
<i>Zones</i>			
North India	419	214	27.2
East India	555	106	19.1
South India	523	118	22.6
West India	547	21	3.8
Central India	892	38	4.3
North-West India	342	71	20.8†††

*Source of figures for the World and the continents—'World's Hunger' by FRANK A. PEARSON and FLOYD A. HARPER

††'Net area sown' plus 'fallow land' has been taken to be as 'area adapted to agricultural production' in India and zones

For India, the net area sown is 2684 lakhs of acres,

Fallow land is 594 lakhs of acres

TOTAL 3278

†††The figures of area adapted to agricultural production and irrigated area given in the statement for India and the six zones relate only to those areas for which village papers are available and not to the entire land area. The percentage of area for which village papers are available in India is 76.73 and each of the six zones is as follows: North India 99.30, East India 72.23, South India 97.23, West India 84.66, Central India 98.51, North-West India 34.28

Population and Land Use Tables 4.0 to 4.3

Population and Land Utilization in Great Britain

by Dr V. Nath, M.A., Ph. D., of the Planning Commission.

(1) Tables 4.0 and 4.1 show the trends in population and land utilization in Great Britain. The figures of Table 4.0 are for England and Wales and show long period trends from 1870 onwards; those of Table 4.1 are for the United Kingdom and show the trends during World War II and Post-war years.

(2) The population of England and Wales almost doubled during the period—1870 to 1950, the increase being from 22.7 million in 1870 to 44 million in 1950. The most rapid increase took place between 1870 and 1914, by which time population was already about 37 million. After 1914 increase in population has been much slower. This, as is well known, has been due to the marked decline in the British birth-rate. The total area of crop and grass-land, excluding rough grazing, has not changed greatly during this entire period. It was 26.0 million acres in 1870, showed an increase to 27.5 million acres in 1900, but has shown a small decline after that date. After 1937, this acreage has fluctuated between 24 and 25 million acres. This trend in the acreage of crop-and-grass land is characteristic of old densely populated countries, and indicates that practically all the land, which could be brought under use as either crop land or permanent pasture, was already being utilized by 1870, and there was little room for expansion. The small decline in this total acreage which is observed over this period is due most probably to diversion of some of the land to non-agricultural uses such as industries, roads and railways, towns and cities.

(3) Although the total area of crop-and-grass land has not changed much over this period, its distribution between crop land and grassland has shown marked changes, and these changes provide an excellent indicator of the changes which have taken place in British agriculture during this period.

(4) During the 19th Century, the opening up of vast areas of fertile lands in the new world, and development of means of transport, especially the railways and the steam-ships, brought large quantities of grains at progressively lower prices to Britain and the other countries of Western Europe. Under the competition of cheap grain from these countries, the patterns of agriculture in Britain and European countries began to change. The emphasis shifted from cultivation of food crops to production of live stock products, fruits, vegetables etc. Large areas especially in Great Britain were withdrawn from cropping and put under grass. It will be seen from Table 4.1 that the total acreage under crops declined from 11.7 million acres in 1870 to 9.0 million acres in 1900. During the same period, area under permanent grass increased from 11.1 million acres to 15.3 million acres. Also, it will be noticed that among the crops, the worst suffered was wheat, the principal food-grains for human consumption.

(5) This trend towards dependence upon foreign supplies of grains and concentration in domestic agriculture upon livestock and other subsidiary agricultural industries like vegetable-growing, continued after 1900 and barring a brief reversal during World War I, right-up to 1937. It was made possible by availability of cheap grains from the new lands of the world which required markets, and was sustained by rising standards of living at home (because of industrialization), as a result of which larger and larger quantities of milk, meat, fruits, vegetables and similar expensive foods were demanded by the consumers.

(6) But these trends greatly increased dependence upon foreign supplies of food. Besides, grain for human consumption, a large part of foodgrain for supporting the live-stock industries, and increasing quantities of meat, butter, cheese, eggs and other products, were obtained from outside. By 1937, dependence of Great Britain on over-seas sources of supplies was so much that it was estimated that the domestic production contributed only

31% of the food supply in terms of calories. "Before the war, Britain produced about half her total meat supplies, and some 80% of vegetables, all fresh milk, and some two thirds of other milk and of her eggs, but less than one-fourth of the cheese, about 16 per cent of oils and fats, and 12 per cent of wheat and flour intended for food, about 25 per cent of the fruit and 17 per cent of the sugar."

—Agriculture in Britain, Central Office of Information, London, page 8.

(7) During the war years, however, when the over-seas supplies of food were very much reduced, it became absolutely necessary to increase domestic food production as much as possible. Large areas of permanent grass-land were ploughed and brought under grains, potatoes and other crops. It will be seen from Table 4.1 that the acreage under wheat in U.K. increased from 1.9 million acres in 1938 to 3.5 million acres in 1943, that under barley increased from about 1 million acres to 1.8 million acres, and that under potatoes from 7 million acres to 14 million acres. The total area under crops during this five year period increased from 9 million acres to 14.5 million acres, while that under grass was reduced from 18.8 million to 12.3 million acres. After 1943, however, there was no marked change till the end of the war. During the post-war years, with gradually increasing availabilities of food and feed grains from abroad, there has again been a shift in the reverse direction. But this has not been very large, so that even in 1951 the acreage under crops was 12.2 million acres or more than 3 million acres above that in 1938 and under grass only 13.13 million acres as against 18.8 million acres in 1938. As a result of these changes, Britain is producing much more of her food at home than it used to before the war. This is brought by the following figures.—

Contribution of Home Production to Food Supplies Nutrient equivalent of food consumption per head per day.

	Pre-War		1947-48		1948-49	
	Home Production	Per cent of total consumption	Home Production	Per cent of total consumption	Home Production	Per cent of total consumption
Calories	920	31	990	35	1,120	37
Animal protein (gm)	26.7	63	25.0	63	26.9	66
Vegetable protein (gm)	9.3	25	14.2	31	18.6	39
Total Protein (gm)	36.0	45	40.2	46	45.5	51

Source: Economic Survey for 1949 Cmd 7647 H.M.S.O. London Table 6.

(8) The story of Britain is the story par excellence of Western Europe. Rapid increase in population, decline in cultivation per capita cause of little or no increase in area of arable land, increased availability of grain (and later of other feeds), (there are lands of new world) increasing emphasis in domestic agriculture upon livestock and other subsidiary agricultural industries, leading to increasing dependence upon foreign supplies for not only foodgrains, but also for feed-grains and livestock products like, meat, butter, cheese, eggs, etc.

Such a system which is sustained by the exchange of industrial products for the products of the land is, as we have seen, subject to severe strain during times of war, when foreign supplies are cut off. In spite of the best efforts it is not possible for such countries to attain self-sufficiency in food. It will be seen from the above statement that even with all its efforts, Britain could not produce more than about 40% of its total food requirements in terms of calories.

Table 4'6
Trends in Land Use since 1870
England and Wales

[IN THOUSANDS]

	1870	1900	1914	1924	1937	1946	1948	1949	1950
Population	22,712	32,528	36,615	38,507	41,031	42,700	43,502	43,780	44,000
(i) Cropped area (Tillage)	11,684	9,053	8,617	8,381	6,803	10,662	10,682	10,227	10,460
(ii) Temporary grass	3,165	3,165	2,381	2,548	2,221	3,707	3,457	3,696	3,776
(iii) Permanent grass	11,108	15,321	16,116	14,948	15,756	9,947	10,263	10,456	10,505
(iv) Total arable land (i and ii)	14,849	12,218	10,998	10,929	9,024	14,369	14,139	13,923	13,936
(v) Arable land per capita (acres)	0.65	0.38	0.30	0.28	0.22	0.34	0.33	0.32	0.32
(vi) Total crop and grass land (i ii and iii)	25,957	27,539	27,114	25,877	24,780	24,316	24,402	24,379	24,741
Rough grazings	3,203	3,557	3,782	4,946	5,442	5,590	5,559	5,532	5,466
Wheat	3,375	1,796	1,807	1,545	1,732	1,982	2,188	1,899	2,395
Barley	2,128	1,750	1,505	1,314	823	2,003	1,897	1,885	1,625
Oats	1,744	2,077	1,930	2,038	1,223	2,155	1,992	1,946	1,835
Potatoes	407	430	462	452	455	1,009	1,117	929	867
Turnips and swedes	1,712	1,223	1,045	832	440	421	355	339	301
Mangolds	305	412	433	390	207	296	272	267	267
 TOTAL NUMBER OF CATTLE	 4,362	 5,007	 5,878	 5,895	 6,619	 7,244	 7,340	 7,695	 8,001

Table 4'1
Area of Crops and Grassland (1) in United Kingdom

[IN THOUSAND ACRES]

	1938	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951
1 Cereals and fallow *											
Total	8,989	13,666	14,509	14,548	13,849	13,300	12,880	13,180	12,643	12,824	12,202
Wheat	1,928	2,516	3,464	3,220	2,274	2,062	2,163	2,279	1,963	2,479	2,131
Barley	988	1,528	1,786	1,973	2,215	2,211	2,060	2,083	2,060	1,778	1,908
Oats	2,395	4,133	3,680	3,656	3,753	3,567	3,308	3,335	3,252	3,105	2,857
Mixed corn	95	546	501	424	433	458	498	598	680	838	836
Rye (grain)	17	59	129	120	80	55	35	61	64	71	54
Potatoes	733	1,304	1,391	1,417	1,397	1,433	1,330	1,548	1,308	1,235	1,050
Sugar beet	336	425	417	431	417	436	395	413	421	429	429
2 Temporary grassland											
Total	3,968	3,831	4,219	4,725	5,334	5,679	5,651	5,484	5,726	5,531	5,796
For mowing (8)	1,783	2,102	2,333	2,491	3,830	2,902	2,963	2,724	2,937	2,754	3,004
For grazing	2,185	1,729	1,885	2,234	2,505	2,777	2,688	2,760	2,789	2,777	2,792
3 Permanent grassland :											
Total	18,798	13,706	12,330	11,735	11,840	12,030	12,404	12,398	12,687	12,770	13,133
For mowing (8)	4,623	3,533	2,992	2,613	2,702	2,599	2,899	2,962	2,941	3,074	3,129
For grazing	14,175	10,173	9,339	9,122	9,137	9,432	9,505	9,436	9,746	9,696	10,004
4 Crops and grass(2) *											
Total (1+2+3)	31,755	31,204	31,058	31,008	31,023	31,010	30,935	31,062	31,056	31,126	31,131
Arable land (1+2)	12,957	17,497	18,728	19,273	19,183	18,980	18,531	18,664	18,369	18,356	17,998
Permanent grass-land	18,798	13,706	12,330	11,735	11,840	12,030	12,404	12,398	12,687	12,770	13,134
5 Rough grazings	16,589	16,959	17,119	16,985	17,260	17,263	17,163	17,211	17,192	17,103	17,066

(1) Excluding holdings of one acre or less in extent in Great Britain and less than one quarter of an acre in Northern Ireland

(2) Excluding rough grazings. Including estimates for certain items (mainly among fodder and horticultural crops) not separately returned in June

(3) Including 87,000 acres temporarily out of use through flooding

(7) Clover and rotation grasses, including lucerne before 1950

(8) For hay, silage, drying or seed production

Source : Agricultural Department.

Population and Land Use Table 4.2

Area of Crops and Grasslands (1) in United Kingdom by Use

[IN THOUSAND ACRES]

	1938	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951
<i>Crops and grass (2) :</i>											
Total	31,755	31,204	31,058	31,008	31,023	31,010	31,022(3)	31,062	31,056	31,126	31,131
Arable land	12,957	17,497	18,728	19,273	19,183	18,980	18,531	18,664	18,369	18,356	17,998
Permanent grass-land	18,798	13,706	12,330	11,735	11,840	12,030	12,404	12,398	12,687	12,770	13,134
<i>Crops and fallow</i>											
Total	8,989	13,666	14,509	14,548	13,849	13,300	12,880	13,180	12,643	12,824	12,202
Wheat	1,928	2,516	3,464	3,220	2,274	2,062	2,163	2,279	1,963	2,479	2,131
Barley	988	1,528	1,786	1,973	2,215	2,211	2,060	2,083	2,060	1,778	1,908
Oats	2,395	4,733	3,680	3,656	3,753	3,567	3,308	3,335	3,252	3,105	2,857
Mixed corn	95	546	501	424	443	458	498	598	680	838	836
Rye (grain)	17	59	129	120	80	55	35	61	64	71	54
Potatoes	733	1,304	1,391	1,417	1,397	1,423	1,330	1,548	1,308	1,235	1,050
Sugar beet	336	425	417	431	417	436	395	413	421	429	425
<i>Temporary grassland(7) :</i>											
Total	3,968	3,831	4,219	4,725	5,334	5,679	5,651	5,484	5,726	5,531	5,796
For mowing (8)	1,783	2,102	2,333	2,491	2,830	2,802	2,963	2,724	2,937	2,754	3,004
For grazing	2,185	1,729	1,885	2,234	2,505	2,777	2,688	2,760	2,789	2,777	2,792
<i>Permanent grassland</i>											
Total	18,798	13,706	12,330	11,735	11,840	12,030	12,404	12,398	12,687	12,770	13,134
For mowing (8)	4,623	3,533	2,992	2,613	2,702	2,599	2,899	2,962	2,941	3,074	3,129
For grazing	14,175	10,173	9,339	9,122	9,137	9,432	9,505	9,436	9,746	9,696	10,004
Rough grazings	16,589	16,939	17,119	16,985	17,260	17,263	17,163	17,211	17,192	17,103	17,066

(1) Excluding holdings of one acre or less in extent in Great Britain and less than one quarter of an acre in Northern Ireland

(2) Excluding rough grazings. Including estimates for certain items (mainly among fodder and horticultural crops) not separately returned in June

(3) Including 87,000 acres temporarily out of use through flooding

(7) Clover and rotai on grasses, including lucerne before 1950

(8) For hay making drying or seed production

80

Source : Agricultural Department
Annual Abstract of Statistics
(U.K.) 1952.

Population and Land Use Table 4'3

Estimated Yield per Acre (1)

	Unit	1938	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951
Wheat	Cwt	20.4	20.4	19.9	19.5	19.1	19.1	15.4	20.7	22.5	21.0	21.7
Barley	Cwt	18.3	18.9	18.4	17.8	19.0	17.8	15.7	19.5	20.7	19.2	20.3
Oats	Cwt	16.6	17.2	16.7	16.2	17.3	16.3	15.2	17.8	18.4	17.3	18.3
Potatoes	Tons	7.0	7.2	7.1	6.4	7.0	7.1	5.8	7.6	6.9	7.7	7.9

(1) Excluding holdings of one acre or less in extent in Great Britain and less than one quarter of an acre in Northern Ireland

Source : Agricultural Departments
Annual Abstract of Statistics
(U.K.) 1952

Population and Land Use Table 5.0 to 5.5

Population, Land Utilization and Agricultural Production in the United States.

(by Dr V. Nash, M.A., Ph.D. of the Planning Commission)

POPULATION AND LAND UTILIZATION (Tables 1 and 2)

(1) The figures of Tables 5.0 and 5.1 extend over the 100 year period—1850—1950. During the first half of this period, 1850 to 1900, the United States saw the most rapid expansion of settlement and cultivation in its history, caused by the opening up of vast areas of fertile lands in the Middle-Western and Western parts of the country. This process of expansion of settlement had been going on in the U.S. for more than two centuries before 1850. But it reached its peak during this period. There were two main reasons for this:

(i) Development of transport facilities especially the railroad and the steamship. The former linked up the new lands with the older settlements in the East, brought large numbers of settlers to the new lands, and carried food-grains and other produce from these lands to the markets of the East and for exports overseas. The latter, by greatly reducing the time and cost of transport to foreign markets helped in rapidly expanding the exports from the newly settled areas.

(ii) By this period, the wave of settlement had already crossed the forested areas of Eastern United States. Settlement in this period was mainly in open grassland country and was, therefore, much more easy and rapid.

(2) Settlers to the new lands came from the older settlements in Eastern United States, and also from the countries of Northern and Western Europe, especially Great Britain, France, Holland, Belgium, Germany and the Scandinavian countries. In order to facilitate rapid settlement of these lands special laws called the Homestead Laws were passed. Under these, a specified area (generally 160 acres, more in dry parts) was given free to any settler who would develop the land and establish a family farm. (See two extracts below from the Homestead Laws). Large grants of land were also given to rail-roads and other enterprises for development of settlements.

"Every person who is the head of a family, or who has arrived at the age of twenty-one years, and is a citizen of the United States, or who has filed his declaration of intention to become such, as required by the naturalization laws, shall be entitled to one-quarter section* or a less quantity, of unappropriated public lands, to be located in a body in conformity to the legal sub-divisions of the public lands."

"Any person who is a qualified entryman under the homestead laws of the United States may enter, by legal sub-divisions, under the provisions of this section, in the States of Arizona, California, Colorado, Kansas, Montana, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington, and Wyoming, three hundred and twenty acres, or less of nonmineral, nonirrigable, unreserved, and unappropriated surveyed public lands which do not contain merchantable timber, located in a reasonably compact body, and not over one and one-half miles in extreme length. Provided, that no lands shall be subject to entry under the provisions of this section until such lands shall have been designated by the Secretary of the Interior as not being, in his opinion, susceptible of successful irrigation at a reasonable cost from any known source of water supply."

(3) By 1900, however, the greater part of the new lands had been occupied, and the process was virtually completed by 1920. It will be seen from the figures of Table 5.0 that total farm land which stood at 294 million acres in 1850, had increased to 839 million acres by 1900. The area of cropland (Table 5.1) increased even more rapidly—from 76 million acres in 1850 to 319 million acres in 1900. By 1920, it totalled 402 million acres. After 1920, however, there has been practically no increase in cropland. The figures of different years show small variations, but these are due mainly to seasonal or economic factors. Figures of the total area of farmland continue to show some increases after 1920. But this is due not to any expansion of cultivation, but mainly to the transfer of certain public grazing lands to private ownership. The total increase in farmland between 1920 and 1945 is of the order of 200 acres, and is entirely due to increase in area of farm pastures.

*One quarter section equals 160 acres.

The area of Non-farm grazing lands shows corresponding decrease during the period

(4) Side by side with expansion in cultivation after 1850, there was a very rapid increase in population also. The population of U S A increased from 23 million in 1850 to 76 million in 1900 and to 106 million in 1920. Large numbers of immigrants, attracted by the opportunities afforded by the opening up of vast new lands and the growth of industries and towns flooded the country.

Immigration was in the early part of this period mainly from the countries of Northern and Western Europe, but as time went on larger and larger numbers came from countries of Central, Southern and Eastern Europe. After 1900, the latter countries were sending the largest number of immigrants. For a time, expansion in cultivation was even more rapid than population increase, with the result that cropland *per capita* which was 3.3 acres in 1850, increased to 4.2 acres by 1900. After 1900, however, population increase, outstripped increase in cultivation and cultivation *per capita* began to decline. After 1920, cultivation has increased very little, but population increase has continued. Between 1920 and 1950, population has increased from 106 million to 151 million, cultivation has increased only from 402 to 409 million acres, and cultivation *per capita* has declined from 3.8 acres to 2.7 acres, or nearly 30%.

B. CROP PRODUCTION AND EXPORTS

(5) Tables 5.2, 5.3 and 5.4 show the trends in acreage, production, imports and exports of wheat, corn and cotton, the three most important crops of the United States.

WHEAT [TABLE 5.2(i) AND 5.3(i)]

(6) Table 5.2 (i) shows, acreage, production, yields etc of wheat from 1866 onwards. Table 5.3 (i) shows the exports of wheat and wheat flour from 1852 onwards. It will be seen that acreage under wheat which averaged about 22 million acres in the decade—1866—1875, increased to about 47 million acres by the turn of the century. Production during the same period increased from 270 million bushels to about 630 million bushels and exports from about 50 million bushels to about 200 million bushels. This rapidly rising trend was checked during the next decade or so, but was resumed with the beginning of World War-I. Especially, in the years following the World War-I, when there

was a large overseas demand for wheat and prices of wheat were very high, acreage and production of wheat showed a large increase. During the quinquennium—1916 to 1920—acreage increased to nearly 60 million acres, production to about 800 million bushels and exports to 240 million bushels. All these figures, were record figures upto that time. After 1920 however, with the gradual return of normal conditions in the war-affected countries of Europe, exports demand decreased and prices declined. Domestic production continued to be fairly high for some years, but with the coming of the depression in the early thirties, there was a sharp decline. The lowest figures for acreage production and exports in the inter-war years were recorded between 1931 and 1935 when the acreage was only about 52 million acres production 681 million bushels and exports about 50 million bushels. With the entry of the United States in World-War II in 1941, prices again began to increase rapidly and production also increased. Acreages production and exports of wheat have been at "all-time highs" during the recent post-war years. During the post-war years—1946—50—acreage under wheat has averaged over 70 million acres, production about 1.2 billion bushels and exports about 400 million bushels.

CORN . [TABLE 5.2 (ii) AND 5.3 (ii)]

(7) Corn is the most important grain crop of the United States. Between 1/4 to 1/5 of the cropland of the country is devoted to its production and it accounts for about one-half of the entire cereal production of the country. Corn, however, is produced in the United States almost exclusively for livestock feed chiefly for feeding hogs, beef and dairy cattle. The balance is divided between industrial uses and human consumption. Thus, the quantity used for direct human consumption is generally not more than about 5% of the total crop.*

*Average disposition of corn production for 1942-46 was as follows —

	Thousand bushels
Human consumption (incl breakfast foods, etc)	99 312
Industrial Uses	150 115
Seed	12 687
Feed other uses and waste	2 790 466
Exports	35 625
TOTAL	3 098,185

It will be seen from table 5 2 (i) that the production of corn increased from about 1 billion bushels in the decade, 1866-1875, to about 2 5 billion bushels by the turn of the century. After that, increase was rather slow. During the quinquenniums 1916-20 and 1921-25 production reached 2 7 billion bushels, but after that there was a decline again, and during the depression years of the 1930's, production was low, the average for the quinquennium—1936-40—being only 2 35 billion bushels. Production began to increase during the war years under the influence of increased demand and high prices, and in the post-war years, 1946-50, it has reached an all time high average of 3 15 billion bushels.

(8) It is of interest to note that the record crops of the recent post-war years have not been achieved by increasing the acreages under corn. Acreages under the crop during these years have actually been lower than in earlier years. The large increase in production is due entirely to higher yields per acre. Yields of corn during the 1940's have been considerably higher than in the earlier years. Part of the increase is due to favourable weather conditions during these years. Another important reason is the marked increase in corn yields in recent years, caused mainly by the introduction of hybrid corn which gives much higher yields per acre than the ordinary varieties.

(9) Exports of corn are shown in Table 5 3(i). These have never been large, as the bulk of the corn crop is used within the country for livestock feeding.

COTTON (TABLE 5 4)

(10) Cotton is the most important non-food crop in U.S.A. Figures of production and exports imports etc shown in this table are from 1905 onwards. Production of cotton had by this time already reached a level, which has not been greatly exceeded since. Production in 1905 was 13 45 million bales and the average for the quinquennium, 1905-09 was 12 2 million bales. In only two quinquennia since that time has production been larger. The highest average production for any quinquennium was about 15 million bales in 1925-29, and the lowest was 10 5 million bales in the quinquennium immediately preceding it, i.e., in 1920-1924.

These variations are fluctuations caused mainly by seasonal and demand factors. They do not reveal any secular trends, and one can say that the level of cotton production in the U. S. A., has remained more or less unchanged over the last 40 years.

(11) Domestic consumption of cotton, however, has been steadily increasing during this period. During the quinquennium, 1935-09, domestic consumption averaged about 4 7 million bales or a little more than 1/3 of the production, leaving about 7 5 million bales for export. From this figure of 4 7 million bales, domestic consumption has progressively increased and during the war years 1940 to 1944 and the post-war years 1945-1949 it has averaged about 10 million bales. Even if the normal demand may be considered to be somewhat lower, say, between 8 to 10 million bales, it is certain that the surplus available for exports is now much less than it was 40 years ago.

FERTILIZER CONSUMPTION (TABLE 5 5)

(12) We have referred above to the increase in yield of corn. In fact, increase in crop yields has been an important feature of U. S. agriculture in recent years. Yields of all important grains—wheat, corn, oats, barley, and also of other crops like cotton have shown significant increases during recent years. These increases have been brought about by improvement in agricultural techniques; by the application of scientific knowledge to agriculture on an increasing scale. Increased use of machinery leading to more intensive and more efficient cultivation, improved seeds (of which hybrid corn is an outstanding example), greater use of fertilizers, better control over pests and diseases, improvement in livestock through better methods of breeding and feeding are some of the features of this improvement in agricultural techniques. An index of the trends in agricultural improvement is given by the figures of the use of commercial fertilizers. These figures are available for the last 100 years and have been produced in table 5 5. It will be seen from these, that the use of fertilizers has been increasing steadily and that it has gone up especially rapidly during the war and post-war years. The limit of cultivation having been reached, the emphasis in U. S. A., as in all countries, is now on intensification of agriculture.

Population and Land Use Table 5⁰

Land Utilization in U.S.A.—Land and Water Area, By Type: 1850-1945

(In millions of acres Total farm land and total nonfarm land acreages are for the calendar year indicated; cropland and pasture land acreages usually relate to the preceding year.)

Year	Total Area*			Farm Land					Nonfarm Land			
	Grand Total	Land	Inland Water	Total	Crop-land	Farm Pasture	Farming Woodland	Other land in farms	Total	Grazing land**	Forest land**	Other non-farm land
1	2	3	4	5	6	7	8	9	10	11	12	13
1945	1,934	1,905	29	1,142	403	529	166	44	763	292	322	149
1940	1,934	1,905	29	1,061	399	461	157	44	844	382	325	137
1935	1,937	1,903	34	1,055	416	410	185	44	848	411	306	131
1930	1,937	1,903	34	987	413	379	150	45	916	437	349	130
1925	1,937	1,903	34	924	391	331	144	58	979	495	354	130
1920	1,937	1,903	34	956	402	328	168	58	947	502	319	126
1910	1,937	1,903	34	879	347	284	191	57	1,024	600	301	123
1900	1,937	1,903	34	839	319	276	191	53	1,064	625	318	121
1890	1,937	1,903	34	623	248	144	190	41	1,280	818	344	118
1880	1,937	1,903	34	536	188	122	190	36	1,367	883	368	116
1870	1,937	1,903	34	408	189***		219†		1,495	‡	‡	‡
1860	1,937	1,903	34	407	163***		244†		1,496	‡	‡	‡
1850	1,918	1,884	34	294	113***		181†		1,590	‡	‡	‡

*1920 data used also for 1925, 1930 data for 1935; and 1940 for 1945. Land and water areas were completely re-measured in 1940. The difference between the new measurements and those reported in earlier years is due primarily to the redetermination of the outer limits of the United States, the movement in mapping, and the fact that certain bodies of water included in previous measurements were omitted under the definitions adopted in 1940.

**More than half the forest and woodland in the United States is grazed by livestock. Nonfarm grazing land includes woodland and other noncommercial-forest land.

***Improved farm land

†Unimproved farm land.

‡Not available

Population and Land Use Table 5:1

Population and Cropland in the United States, 1850-1950

Year	Population*	Improved land†	Land actually used for crops‡	Land available for crops§	Land actually used for crops||
1	2	3	4	5	6
	Million	Million acre	Million acre	%	%
1850	23	117	N.A.	...	...
1860	31	161	N.A.	...	...
1870	39	169	N.A.	...	...
1880	50	235	N.A.	...	...
1890	63	301	N.A.	...	...
1900	76	311	N.A.	...	...
1910	92	370	N.A.	...	...
1920	106	503	N.A.	...	...
1925	114	517***	405	...	...
1930	121	536***	422	...	...
1935	127	520***	411	...	...
1940	132	527***	410	...	...
1945	139	531***	412	...	...
1950	151	536***	410	...	...

* Data on population for all years are from U. S. Bureau of the Census reports and releases.

† Improved land is all land regularly tilled or mowed, land in pasture which has been cleared or tilled, fallow land, land in orchards, gardens, vineyards, etc., and farmsteads. Data are from the census or are estimates based largely on census data. This classification was discontinued by the census after 1920.

‡ The land available for crops as reported by the Census of Agriculture 1925 to 1940 is the nearest comparable figure for that given for improved land. Land available for crops includes all cropland and plowable pasture. The land available for crops in 1945 is all cropland from census and national summaries of the Department of Agriculture.

§ All cropland as defined here is all land used for crops, including cropland harvested, fallow, and fallow or idle cropland. Cropland also may be defined as acreage actually used for crops, that is, cropland harvested, crop failure, and fallow land, exclusive of that classified as idle. Land actually idle, however, any one year seldom is more than 6 to 8 per cent of the cropland area as given in this table. Land is left idle for a number of reasons, including the need for restoration of crop and pasture land by rotation and changes in use, and the desirability in some areas to have a small reserve acreage to prepare for crops in advance of the planting season. Some cropland remains idle because of wet weather floods, or drought, lack of labour and machinery, or of opportunities for more profitable employment.

*** Estimated.

Population and Land Use Table 542

Acres harvested and yield per acre

(i) WHEAT

Year	Acres harvested (1000 acres)	Production (1000 bushels)	Farm Value (1000 dollars)	Yield per acre (bushels)	Index number of prices*	Price (cents per bushel)
1	2	3	4	5	6	7
1905-74	21,915	270,595	337,186	12.3	122.3	124.6
1906-1907	24,553	348,337	413,730	13.0	90.6	92.3
1908-1909	25,496	426,076	356,288	13.7	66.4	67.7
1910-1911	17,255	630,354	413,935	13.3	64.5	65.7
1912-1913	47,002	674,843	183,123	14.4	70.3	71.6
1914-1915	45,105	664,299	579,992	14.7	85.7	87.3
1916-1917	53,247	801,050	712,938	15.0	87.3	89.0
1918-1919	60,455	790,773	1,526,204	13.3	189.4	193.0
1920-1921	57,555	787,052	557,067	13.7	109.1	111.2
1922-1923	60,300	866,870	883,173	14.4	100.0	101.9
1924-1925	51,026	630,865	406,253	13.1	58.9	60.0
1926-1927	57,706	707,307	614,151	13.6	77.0	78.4
1928-1929	56,354	684,700	1,252,507	17.5	123.9	126.3
1930-1931	70,530	1,195,869	2,426,184	17.0	197.6	201.4
1932	49,424	552,215	410,770	11.2	73.0	74.4
1933	43,347	526,052	446,085	12.1	83.2	84.8
1934	51,305	628,227	521,915	12.2	81.5	83.1
1935	49,125	629,880	645,465	12.8	100.6	102.5
1936	64,169	873,911	840,706	13.6	94.4	96.2
1937	69,197	919,913	516,636	13.3	55.2	56.2
1938	62,668	748,180	512,401	14.1	67.8	69.1
1939	53,273	814,646	555,547	15.3	66.9	68.2
1940	55,835	941,970	859,561	16.8	92.6	94.4
1941	49,773	969,381	1,064,789	19.5	107.9	110.0
1942	51,355	843,813	1,148,845	16.4	133.5	136.0
1943	59,749	1,060,111	1,497,693	17.7	138.4	141.0
1944	65,120	1,105,224	1,661,649	17.0	147.2	150.0
1945	67,075	1,153,046	2,203,246	17.2	187.4	191.0
1946	74,389	1,367,186	3,128,587	18.4	224.7	229.0
1947	73,017	1,313,534	2,614,439	18.0	195.3	199.0
1948	76,559	1,141,188	2,141,564	14.9	184.5	188.0
1949	61,610	1,019,389	2,043,082	16.5	196.3	200.0
1950	61,424	987,474	2,091,535	16.1	208.0	212.0
1951 (Preliminary)						

Source: (i) Table No. 707, page No. 650, Statistical Abstract of United States, 1952

(ii) Table No. 747, page 615, Statistical Abstract of United States, 1952

*With 1926-30 as base (100)

Population and Land Use Table 5-2--*concl.*

Acres harvested and yield per acre

(II) CORN

Year	Acres harvested (1000 acres)	Production (1000 bushels)	Farm Value (1000 dollars)	Yield per acre (bushels)	Index number of prices*	Price (cents per bushel)
1	2	3	4	5	6	7
1866-75	.	40,123	1,028,963	561,163	25 6	70 6
1876-85	.	63,655	1,667,510	652,608	26 2	50 6
1886-95	.	78,327	1,986,608	725,562	25 4	47 3
1896-1900	.	94,213	2,523,555	711,706	27 7	36 5
1901-05	.	95,226	2,529,114	1,113,625	26 6	36 5
1906-10	.	97,894	2,735,480	1,450,885	27 9	57 0
1911-15	.	100,294	2,609,562	1,720,900	26 0	68 8
1916-20	.	102,631	2,704,768	3,342,953	26 4	85 5
1921-25	.	101,275	2,706,506	2,033,203	26 7	159 8
1926-30	.	99,483	2,484,935	1,919,033	25 0	97 5
1931-35	.	102,306	2,330,431	1,137,535	22 8	100 0
1936-40	.	90,790	2,347,096	1,432,749	25 9	63 2
1941-45	.	89,375	2,931,095	3,031,463	32 8	83 8
1946-50	.	85,467	3,150,590	4,779,346	36 9	133 4
1951	.	105,918	2,397,593	1,246,777	22 6	202 1
1952	.	92,193	1,448,920	1,181,479	15 7	67 4
1953	.	95,974	2,299,363	1,506,281	24 0	52 0
1954	.	93,114	1,505,689	1,571,859	16 2	81 5
1955	.	93,930	2,642,978	1,368,474	28 1	84 8
1956	.	92,160	2,548,753	1,239,619	27 7	64 7
1957	.	88,279	2,580,912	1,465,075	29 2	133 4
1958	.	86,429	2,457,146	1,518,719	28 4	67 1
1959	.	85,357	2,651,889	1,991,103	31 1	51 8
1960	.	87,367	3,063,562	2,813,772	35 1	70 4
1961	.	92,060	2,965,980	3,328,496	32 2	67 1
1962	.	94,014	3,088,110	3,353,386	32 8	51 8
1963	.	88,079	2,880,933	3,670,567	32 7	75 1
1964	.	88,489	3,249,950	5,081,927	36 7	91 7
1965	.	83,922	2,383,970	5,145,345	23 4	118 8
1966	.	86,067	3,681,793	4,778,843	42 8	145 1
1967	.	87,029	3,379,436	4,211,005	38 8	168 4
1968	.	81,817	3,057,803	4,679,612	37 4	161 9
1969	.	81,306	2,941,423	4,934,921	36 2	198 2
1970 (Preliminary)	.					217 6
1971	.					125 0
1972	.					153 0
1973	.					168 0

Source: (i) Table No 707, page No 650, Statistical Abstract of United States, 1952

(ii) Table No 741, page 615, Statistical Abstract of United States, 1952

*With 1926-30 as base (100)

Population and Land Use Table 5.3

Exports and Imports: 1852 to 1951

(i) WHEAT

(Pounds per bushel of wheat, 60; per barrel of wheat flour, 196)

Yearly average or year ending June 30	Exports (excl Re-exports)				Imports— wheat and flour
	Wheat (grain)	Wheat flour	Wheat and flour		
	1	2	3	4	5
		1,000 bushels	1,000 barrels	1,000 bushels	1,000 bushels
1852—1856	.	4,715	2,892	19,173	4,178
1857—1861	.	12,378	3,318	28,970	6,979
1862—1866	.	22,530	3,531	40,184	4,728
1867—1871	.	22,107	2,585	35,032	1,818
1872—1876	.	48,958	3,416	66,037	1,680
1877—1881	.	107,781	5,376	133,263	906
1882—1886	.	82,884	8,620	121,675	517
1887—1891	.	64,739	11,287	115,529	352
1892—1896	.	99,914	15,713	170,624	1,634
1897—1901	.	120,247	17,151	197,427	1,280
1902—1906	.	70,527	15,444	140,026	993
1907—1911	.	62,855	11,841	116,138	706
1912—1916	.	129,415	13,185	188,748	2,996
1917—1921	.	155,646	19,167	241,899	26,064
1922—1926	.	140,149	14,274	207,237	17,473
1927—1931	.	114,781	12,763	174,766	16,491
1932—1936	.	27,908	4,763	50,295	21,106
1937—1941	.	41,189	5,679	67,879	16,512
1932	.	96,521	8,357	135,799	12,886
1933	.	20,887	4,324	41,211	9,380
1934	.	18,800	3,873	37,002	11,494
1935	.	3,019	3,939	21,532	25,134
1936	.	311	3,323	15,929	4,638
1937	.	3,168	3,918	21,584	47,924
1938	.	83,740	4,990	107,194	3,561
1939	.	84,589	6,637	115,784	9,623
1940	.	23,636	6,519	54,274	10,430
1941	.	10,810	6,329	40,557	11,024
1942	.	12,632	4,986	36,064	15,576
1943	.	6,555	5,712	33,401	8,752
1944	.	11,942	8,342	51,149	147,255
1945	.	19,010	8,255	57,811	51,561
1946	.	22,613	20,717	323,506	13,624
1947	.	144,029	36,313	314,702	2,041
1948	.	N A	N A	479,752	N A
1949	.	N A	N A	595,303	N A
1950	.	N A	N A	314,231	N A
1951	.	N A	N A	373,870	N A
1942—46	.	55,255	9,602	100,386	47,354
1947—51	397,560	...

Source: Statistical Abstract of the United States, 1948 and 1952.

Exports and Imports : 1852 to 1951
(ii) CORN
(Corn in thousands of bushels of 56 pounds)

Yearly average or year ending June 30—	Corn	
	Exports*	Imports
1	2	3
1852—1856	7 123	
1857—1861	6 555	48
1862—1866	12 060	56
1867—1871	9 924	75
1872—1876	38 561	57
1877—1881	88 190	12
1882—1886	49 992	24
1887—1891	54 606	15
1892—1896	63,980	9
1897—1901	192 531	4
1902—1906		
1907—1911	74,615	20
1912—1916	56 568	92
1917—1921	38,774	5 686
1922—1926	45,296	4 950
	66,759	1,148
1927—1931		
1932—1936	18,941	1 859
1937—1941	4,170	10 507
1942	45,726	23 018
1943	20 221	610
	9 062	100
1944		
1945	10,929	156
1946	15,769	0 606
1947	13 601	412
1948	76 029	634
	33 695	
1949		
1950	90,621	N A
1951	109,670	N A
	116,030	N A

Source Statistical Abstract of the United States
1948 and 1952.

*Exports include meal in terms of grain

Population and Land Use Table 5.4

Production, Consumption, Exports, Imports, Prices, and Carry-Over: 1905 to 1951

(1) COTTON

[ALL FIGURES EXCEPT NET WEIGHT AND PRICE, IN THOUSANDS OF BALES]

Year ending July 31	Cotton (Exclusive of Linterns)							
	Production		Average net weight of bale (16s)	Average price per pound upland cotton (cents)	Consumption (running bales)	Exports of domestic cotton (running bales)	Imports (equivalent 500-pound bales)	Carry-over (running bales)
	Running bales, counting round as half bales	Equivalent 500 pound bales, gross weight						
1	2	3	4	5	6	7	8	9
1905	13,451	13,438	478	8 7	4,279	8,560	130	1 935
1906	10,495	10,575	482	10 9	4,909	6,906	133	1,349
1907	12,983	13,274	489	10 0	4,985	8,616	203	1 515
1908	11,058	11,107	480	11 5	4,539	7,465	141	1,236
1909	13,086	13,242	484	9 2	5,092	8,635	165	1,484
1910	10,073	10,005	475	14 3	4,622	6,206	151	1,040
1911	11,568	11,609	480	14 0	4,498	7,788	231	1,375
1912	15,553	15,693	483	9 6	5,129	10,719	229	1,777
1913	13,489	13,703	486	11 5	5,483	8,746	225	1 598
1914	13,983	14,156	484	12 5	5,577	9,151	266	1,448
1915	15,906	16,135	485	7 3	5,597	8,323	364	3,936
1916	11,068	11,192	484	11 2	6,398	5,896	421	3,140
1917	11,364	11,450	482	17 3	6,789	5,300	288	2,720
1918	11,248	11,302	480	27 1	6,566	4,288	217	3,450
1919	11,906	12,041	484	28 8	5,766	5,392	197	4,287
1920	11,326	11,421	482	35 4	6,420	6,545	683	3,563
1921	13,271	13,440	484	15 8	4,893	5,745	211	6,534
1922	7,978	7,954	476	16 9	5,910	6,184	352	2,832
1923	9,729	9,762	480	22 9	6,666	4,823	450	2,325
1924	10,171	10,140	477	28 7	5,681	5,656	272	1,556
1925	13,639	13,628	478	22 9	6,193	8,005	303	1,610
1926	16,123	16,104	478	19 6	6,456	8,051	314	3,543
1927	17,755	17,877	484	12 5	7,190	10,927	382	3,712
1928	12,783	12,956	485	20 2	6,834	7,542	321	2,596
1929	14,297	14,478	484	18 0	7,091	8,044	442	2,312
1930	14,548	14,825	487	16 8	6,106	6,690	368	4,530
1931	13,756	13,932	484	9 5	5,263	6,760	99	6,370
1932	16,629	17,096	492	5 7	4,866	8,708	107	9,678
1933	12,710	13,002	490	6 5	6,137	8,849	124	8,165
1934	12,664	13,047	493	10 3	5,700	7,534	141	7,744
1935	9,472	9,637	487	12 4	5,361	4,799	106	7,208
1936	10,420	10,638	488	11 1	6,351	5,973	152	5,409
1937	12,141	12,399	489	12 3	7,950	5,440	249	4,499
1938	18,252	18,945	497	8 4	5,748	5,598	158	11,533
1939	11,623	11,944	492	8 6	6,858	3,327	132	13,933
1940	11,481	11,816	493	9 1	7,784	6 192	162	10,564
1941	12,298	12,565	489	9 9	9,722	1,112	188	12,166
1942	10,495	10,742	491	17 0	11,170	1,125	252	10,640
1943	12,438	12,820	495	19 0	11,100	1,480	168	10 657
1944	11,129	11,429	493	19 9	9,943	1,138	129	10,744
1945	11,839	12,230	496	20 7	9,568	2 009	190	11 164
1946	8,813	9,016	491	22 5	9,163	3,613	343	7,326
1947	8,517	8,639	507	32 6	10,025	3,545	284	2,530
1948						1,970		
1949	NA	NA	NA	NA	NA	4,747	NA	NA
1950	NA	NA	NA	NA	NA	5,770	NA	NA
1951	NA	NA	NA	NA	NA	4,117	NA	NA

Source: Statistical Abstract of the United States 1943

Population and Land Use Table 5'5

Fertilizer Consumption : 1850 to 1950

Commercial Fertilizer						
Year	Nutrients contained				Farmers' expenditures for fertilizer and lime	Lime consumed on farms
	Consumed in United States @	Nitrogen (N)	Phos-phoric acid (P ₂ O ₅)	Potash (K ₂ O)		
1	2	3	4	5	6	7
1950		NA	NA	NA	821	26,536
1949		17,927	911	1,884	1,064	26,301
1948		17,596	841	1,843	956	24,811
1947		17,397	836	1,775	879	29,834
1946		16,087	756	1,671	852	28,932
1945		*13,981	*679	*1,438	*746	23,023
1944		13,330	640	1,408	649	24,557
1943		11,734	599	1,237	643	18,935
1942		10,331	469	1,131	547	19,838
1941		9,607	458	994	467	15,916
1940		8,656	419	912	435	14,406
1939		7,993	396	789	409	9,066
1938		7,758	384	744	393	7,859
1937		8,433	412	794	416	7,199
1936		7,222	350	673	350	6,566
1935		6,534	312	597	307	3,505
1934		5,794	275	530	263	2,748
1933		5,110	240	464	222	1,548
1932		4,545	214	413	192	1,811
1931		6,541	301	611	275	2,611
1930		8,425	377	793	354	3,588
1929		8,208	352	774	338	3,807
1928		8,215	342	776	333	3,806
1927		7,074	282	667	268	3,798
1926		7,531	286	701	290	3,330
1925		7,503	279	680	283	3,359
1924		6,999	252	630	259	3,217
1923		6,571	230	591	237	3,076
1922		5,795	191	516	226	2,935
1921		4,977	159	443	189	2,794
1920		7,296	228	660	258	2,653
1919		6,751	219	641	88	2,476
1918		6,580	217	625	46	2,306
1917		6,087	213	596	33	2,136
1916		5,214	203	505	16	1,966

* Estimated figures for 1945 and 1946.

Population and Land Use Table 5.5 (concl'd.)

Fertilizer Consumption: 1850 to 1950

Year	Commercial Fertilizer					
	Nutrients contained				Farmers' expenditures for fertilizer and lime	Lime consumed on farms
	Consumed in United States @	Nitrogen (N)	Phosphoric acid (P ₂ O ₅)	Potash (K ₂ O)		
	1,000 Short Tons	1,000 Short Tons	1,000 Short Tons	1,000 Short Tons	Million Dollars	1,000 Short Tons
1	2	3	4	5	6	7
1915 .	5,418	206	515	81	172	1,796
1914 .	7,194	216	662	237	208	1,626
1913 .	6,416	173	571	244	182	1,456
1912 .	5,852	157	521	222	161	1,286
1911 .	6,108	162	544	232	166	1,116
1910 .	5,547	146	499	211	149	946
1909 .	4,821	125	434	178	120	776
1908 .	4,449	107	400	160		
1907 .	4,307	101	392	151		
1906 .	4,249	99	391	144		
1905 .	3,913	90	368	129		
1904 .	3,704	84	344	122		
1903 .	3,382	77	311	108		
1902 .	3,084	70	284	96		
1901 .	3,044	68	282	90		
1900 .	2,730	62	246	86		
1899 .	2,603	60	236	82		
1898 .	2,333	55	212	71		
1897 .	2,131	51	195	63		
1896 .	1,888	50	174	54		
1895 .	1,578	39	147	42		
1894 .	1,773	45	165	45		
1893 .	1,715	45	160	42		
1892 .	1,504	40	141	35		
1891 .	1,584	43	150	26		
1890 .	1,390	38	132	31		
1880 .	753	19	70	13		
1870 .	321	14	31	4		
1860 .	164	10	12	3		
1850 .	53	3	4	1		

NOTE—@Includes HAWAII and Puerto Rico Also fertilizers distributed by Government agencies

Source up to 1945: Series E 105-116, Historical Statistics of United States 1789-1945

1946-1950 Statistical Abstract of U. S. Appendix I for 1952, 1951 and 1950

Population and Land Use Table 6'0 to 6'2

Population, Land Utilization and Food Production in the USSR

(By Dr. Nath M A Ph D., of the Planning Commission)

Tables 6'0 to 6'2 show the trends in population, sown area, production and exports of food-grains in the Soviet Union during the period 1913 to 1939. The figures of these tables have been compiled mainly from the following two sources —

S. P. Trimin "The USSR", London, 1944

Alexander Baykov "The Development of the Soviet Economic System" Cambridge, 1946

The 25 year period covered by these tables is the period during which revolutionary changes occurred in the political and economic life of the Soviet Union. This is the period of World-War I, the Bolshevik Revolution of 1917, the Civil War and the disturbances following the revolution (which led to an almost complete disruption of the country's economic life), the New Economic Policy and the First and the Second Five Year Plans. At the beginning of the period, Russia was still under the Czarist Regime. By its end, the conflicts, disturbances and difficulties following the Bolshevik Revolution has been largely overcome and the country had completed a decade of economic development under the two Five-year Plans.

Population

The population of Soviet Union, which had been growing rapidly during the 19th Century, was estimated at about 139 million by 1914. During the next decade there were very large losses of life — first, due to World-War I, and then as a result of the Civil War and other post-revolutionary disturbances and the famines and scarcities of the early twenties. In 1923, the population was estimated at 137 million or somewhat less than the population of a decade ago. After 1923, however, population has been steadily

increasing. Between 1926 and 1939 i.e., between the 2nd and 3rd General Censuses, the Soviet Union's population increased from 147 to 170.5 million. This is an increase of 23.5 million in 13 years, which works out to a mean annual rate of increase of a little over 1.1 per cent.

Total area sown

In 1913, the total area sown was 105.0 million hectares. With population at about 139 million, sown-area *per capita* came to 0.75 hectares or 1.85 acres. In 1922, sown area totalled only 77.7 million hectares or less than 3/4th of the 1913 total. This figure of sown-area, as also the figures of grain acreage and production in table 1'2 reflect the sharp decline in agricultural production in the years following the 1917 Revolution. First, the Civil War, and then the various economic policies followed by the new regime and the conflicts between the Government and certain classes of people led to an almost complete break-down of the country's economy, during these years. The decline in agricultural production was accentuated also by the peasants' vehement opposition to the Government's measures for securing grain and other agricultural surplus for the urban and industrial areas. With the beginning of the New Economic Policy in 1923, however, production began to increase again. By 1930, when the First Five-Year Plan (launched in 1928) had been in operation for two years, sown-area totalled 127 million hectares, and by 1931 it increased to 136 million hectares. The 1931 figure was nearly 60 million hectares more than the figure of 1922 and 31 million hectares more than the figure of 1913. This increase in sown area was achieved mainly by extension of cultivation in the dry lands of the Lower Volga region, in Siberia and in Soviet Central Asia. After 1931, however, there was practically no increase in sown-area. The figures show minor fluctuations from year to year caused mainly by seasonal factors.

Side by side with this expansion in cultivation, there also occurred a marked change in the cropping pattern. In 1913, nearly 9/10th of the sown area was given to the production of food grains. Commercial crops like cotton, sugar-beets, flax, tobacco, sun-flower etc. (called technical crops in Soviet statistics) occupied a total of

4.6 million hectares, potatoes and vegetables occupied about 4 million hectares, and fodder crops about 2 million hectares. By 1930, the proportion of sown-area occupied by foodgrains had been reduced to about 75% and that under technical crops, potatoes and vegetables and fodder crops had been greatly increased. Between 1913 and 1930, whereas the area under foodgrains increased from 94.4 to 101.8 million hectares, or less than 7%, the area under technical crops increased from 4.6 million to 10.5 million hectares or nearly 2½ times. This emphasis towards increasing production of commercial crops, potatoes and vegetables, and fodder crops was due to the Soviet Government's policy of diversifying agriculture, promoting development of subsidiary agricultural occupations like livestock farming, and increasing production of agricultural raw materials like cotton for the expanding manufacturing industries.

Table 6.1 shows the acreage, production and yields per acre of foodgrains. It will be seen from this table that production of foodgrains, which totalled 800 million quintals in 1913, went down to about 500 million quintals by 1922. After this date, however, there was a steady increase in production and by 1930 production stood at 835 million quintals. During the 1930's production fluctuated between 700 and 950 million quintals, except in 1937, which was an exceptionally good year and in which production exceeded 1100 million quintals. Broadly speaking, therefore, grain production in the 1930's was practically at about the same level as in 1913.

Column 4 in this table gives the yields per acre of foodgrains. In 1913, average yield of foodgrains was 8.5 quintals per hectare. In the 1930's yields fluctuated from 6.7 quintals in 1931 to 11.5 quintals in 1937, the average for the 9 year period 1930-38 being 8.5 quintals per hectare. Thus the yield per acre of foodgrains in the 1930's was also practically the same level as in 1913. This is very significant in view of the fact that between 1913 and the 1930's the agricultural system had been completely revolution-

ized, both as regards its organisation and its techniques of production. In 1913, land was held in small peasant operated farms or in large estates, the farming methods were generally backward and machinery was little used. By the 1930's all this had been completely changed. Collectivisation of agriculture had proceeded to the stage at which most of the farm land was in collective farms, and large areas were in State farms. Machinery was used on an extensive scale and the latest scientific knowledge was being applied to agriculture.

Table 6.2 shows the exports of the principal foodgrains, wheat, barley and rye. Russia was, in the years before World War I, noted for its large exports of foodgrains. In 1913, the total exports of these three grains amounted to nearly 8 million tons, or about 1/5 of the country's total grain production. This figure of 8 million tons has never been reached again. During the 1930's, the exports were rather small, the maximum, 2 million tons being in 1938. Thus, it may be noted, followed the record crop of 1937.

The main reason for the lower exports in the 1930's seems to be increase in domestic demand caused by increase in population in general and in urban population in particular, without any increase in grain production. By 1939, whereas the total population was nearly 32 million (or 22%) above the 1913 figure, grain production was practically at the same level as in 1913.

The changes in production and exports of crops in the Soviet Union may be summarised as follows. Before World War I, Soviet agriculture was a grain crop agriculture, and produced a large grain surplus for export. By the 1930's, agriculture had become much more diversified. Production of technical crops like cotton, sugar beet, flax etc. potatoes and vegetables and livestock products had been greatly increased. The production of foodgrains was still at about the same level as in the pre-war years, but as the domestic demand was much greater, the exportable surplus had been greatly reduced.

Table 6·0
Population and area sown by crops — U. S. S. R.

Year	Population million	Total area sown	Total area under			
			Grain crops	Technical crops	Potatoes and vegetables	Fodder crops
1	2	3	4	5	6	7
1913	139*	105·0	94·4	4·6	3·8	2·0
1922	137†	77·7	66·2	4·0	..	..
1930	147‡	127·2	101·8	10·5	..	..
1931 . . . . .	..	136·3	104·4	14·0	..	..
1932 . . . . .	..	134·4	99·7	14·9	..	..
1933 . . . . .	..	129·7	101·5	12·0	..	..
1934 . . . . .	..	131·4	104·7	10·7	..	..
1935 . . . . .	..	132·8	105·4	10·6	..	..
1936 . . . . .	..	133·8	102·4	10·8	..	..
1937 . . . . .	..	135·3	104·4	11·2	..	..
1938 . . . . .	..	136·9	102·4	11·0	..	..
1939	170·5‡	134·0	99·6	11·1	14·0	9·2

Note:—All areas are in millions of hectares (1 hectare=2·47½ acres)

*1914 estimates

†1923 estimates

‡ 1926, 2nd General Census

‡ 1933, 3rd General Census

Table 6·1
Areas and Yields—U. S. S. R.

<i>Year</i>	<i>Area under grain (in millions of Hectares 1 Hectare=2.47 acres)</i>	<i>Yield of grain (millions of Quintals 1 Quintal=112 lbs.)</i>	<i>Average yield rate (in Quintals per Hectare)</i>
1	2	3	4
1913	94.4	801.0	8.5
1922	65.2	503.1	7.6
1926	93.7	768.3	8.2
1927	94.2	723.0	7.6
1928	92.2	733.2	8.0
1929	96.0	717.4	7.5
1930	101.8	835.5	8.2
1931	104.4	694.8	6.7
✓ 1932	99.7	698.7	7.0
1933	101.5	898.0	8.8
1934	104.7	894.0	8.5
1935	103.4	901.0	8.7
1936	102.4	827.3	8.1
1937	104.4	1202.9	11.5
1938	102.4	949.9	9.3

Table—6.2
Foodgrain Exports—U.S.S.R.

<i>Year</i>	<i>Exports in Millions of Tons</i>			
	<i>Wheat</i>	<i>Barley</i>	<i>Rye</i>	<i>Total</i>
1	2	3	4	5
1913 .	3 33	3 93	0 65	7 91
1930 .	2 53	1 18	0 65	4'36
1931 . .	2 50	0 97	1 10	4'57
1932 .	0 55	0 42	0'42	1 39
1933 .	0 75	0 57	0 16	1 48
1934 .	0'21	0 18	0 10	0'49
1935 . .	0 72	0 59	0 04	1'35
1936 .	0 06	0'11	0 11	0 28
1937 .	0'85	0'22	0 20	1 27
1938 .	1'28	0 41	0'36	2 05

APPENDIX II

BIRTH RATES AND DEATH RATES

Birth Rates and Death Rates

I — *The nature and purpose of this study*

IT IS NECESSARY that the census data about the growth of population should be analysed and the main component elements of the growth of population viz., birth, death and migration separated from one another. To this end, it is necessary to assemble all available data about registration of births and deaths, correlate them to census data, and scrutinise them critically. The collection of data was initiated and the lines of study prescribed in a circular letter issued to all Superintendents of Census Operations on 7th May 1951. This study has been completed with the help of all Superintendents of Census Operations and Shri S. P. JAIN, the Census Actuary. The results are set out in this note.

2. For purposes of this study a change was made in the yard-stick for the measurement of growth of population. In earlier censuses, growth of population used to be measured by 'percentage variation' which expressed the difference between the numbers at the beginning and end of a period as a percentage of the population at the beginning of the period. At this census, the rate of growth is measured by the 'growth rate' which differs from the 'percentage variation' in that, the difference between the numbers at the beginning and end of a period is expressed as a percentage of the arithmetical mean of the population at the beginning and the end of the period. The difference is small; nevertheless, it is worth making. It helps us easily to institute comparison between periods of unequal duration. Even more important, it helps us easily to relate the growth rate to the birth rate and the death rate.

3. The growth during any period is made up of two parts. One is the natural increase and the

other is the net migration. Natural increase in its turn is the excess of births over deaths. If these are expressed as percentages of the mean population during the period under consideration, the growth rate is seen to be the sum of the natural increase rate and the net migration rate. And the natural increase rate is the excess of the birth rate over the death rate. As registration of births and deaths is non-existent in some parts of the country and incomplete in varying degrees in all parts of the country, a clear distinction has to be made between the registered birth rate and the actual birth rate; between the registered death rate and the actual death rate; and, consequently between the registered rate of natural increase and the actual rate of natural increase. The difference between mean decennial growth rate and the mean decennial rate of natural increase ascertained from the registration data will, therefore, not be identical with the mean decennial rate of net migration. There will be a further difference attributable mainly to the incompleteness of registration of births and deaths, and partly also to differential errors (if any) in enumeration at successive censuses. Let us refer to this combined difference as net-migration-cum-statistical error. We have then the formula: Census Growth Rate = Registered Birth Rate minus Registered Death Rate plus Net Migration-cum-Statistical Error. This is the starting point for collection, analysis and review of all relevant data.

4. All the Superintendents of Census Operations have prepared Subsidiary Tables which are designed to exhibit the relation between the census figures of growth of population and the registration figures of births and deaths in accordance with this formula. Basic data have been

compiled for three decades 1941-50, 1931-40 and 1921-30 under the following heads :

- 1 Mean population of the decade;
- 2 Mean population of the decade for area under registration of births and deaths;
- 3 Growth of population during decade,
- 4 Mean decennial growth rate,
- 5 Registered births during decade;
- 6 Mean decennial birth rate (registered),
7. Registered deaths during decade;
- 8 Mean decennial death rate (registered),
9. Decennial rate of natural increase (registered),
- 10 Migration-cum-Statistical error.

The data furnished by the Superintendents of Census Operations have been compiled, and a table prepared, showing the figures for India, states, divisions, zones, regions and sub-regions. The table is printed as *Annexure I* at the end of this APPENDIX.

5. Nature and extent of birth/death registration data—It has been mentioned in paragraph 3 that the registration of births is non-existent in some parts of the country and incomplete in varying degrees in all parts of the country. With reference to the degree of completeness and efficiency of registration, the entire territory of each zone has been divided into the following four categories :

A—Areas for which birth/death registration data are available for all the three decades 1921-30 to 1941-50 and where omissions are not unduly large and the registration may, therefore, be regarded as being reasonably satisfactory. These are : Madras, Coorg, Bombay, Madhya Pradesh, Punjab, Ajmer-Merwara and Delhi, subject to the exception of 'merged' areas within these States.

B—Areas for which birth/death registration are available for all the three decades 1921-30 to 1941-50 but where registration cannot be regarded as being reasonably satisfactory. These are : Uttar Pradesh, Bihar, Orissa, West

Bengal, Assam Plains and Mysore, subject to the exception of 'merged' areas within these States.

C—Areas for which birth/death registration data are available for 1941-50, but not for the previous decades. [In these cases also the registration cannot be regarded as being reasonably satisfactory.] These are Hyderabad, Travancore-Cochin and Himachal Pradesh.

D—Areas for which birth/death registration data are not available at all. These are : Assam Hills, Manipur, Tripura, Sikkim, Saurashtra, Kutch, Madhya Bharat, Bhopal, Vindhya Pradesh, Rajasthan, PEPSU, Bilaspur, Jammu-Kashmir and 'merged' areas in other states.

TABLE I shows the relative magnitude of the different categories of areas in India and the zones, the magnitude being expressed as a percentage of the mean population of the areas in question to the total population during the decade 1941-50.

TABLE I

Zone	A	B	C	D
North India	97.7	..	2.3	
East India	..	88.6		11.4
South India	76.1	11.9	12.0	
West India	60.4	.	.	39.6
Central India	..	35.0	35.1	29.9
North-West India	40.5	.	3.5	56.0
INDIA	31.5	42.9	8.0	17.6

6 It will be seen from *Annexure I* that the table excludes not only areas of Category D,

but also Hyderabad whose figures were rejected as too defective to be worth compiling. Figures are furnished for the other areas of Category C (Travancore-Cochin and Himachal Pradesh), but

they have not been included in the totals for India and the zones. These totals (which are limited to areas of Categories A and B) are reproduced in TABLE 2 below :

TABLE 2

Zone	Mean decennial growth rate (Census)			Mean decennial growth rate (Census)—Areas of Categories A & B			Mean decennial birth rate (Registered)—Areas of Categories A & B			Mean decennial death rate (Registered)—Areas of Categories A & B		
	1941-50	1931-40	1921-30	1941-50	1931-40	1921-30	1941-50	1931-40	1921-30	1941-50	1931-40	1921-30
1	2	3	4	5	6	7	8	9	10	11	12	13
INDIA	22.5	13.3	10.4	22.4	13.0	9.6	27.2	33.8	33.7	19.4	23.0	25.3
North India	21.2	12.7	6.5	21.2	12.8	6.5	24.8	34.2	34.0	16.3	21.9	25.6
East India	10.8	14.4	10.8	10.8	14.3	10.4	21.7	29.8	32.5	17.5	21.7	25.3
South India	15.3	11.7	10.9	14.5	11.0	9.4	28.8	32.8	30.1	19.4	21.3	21.3
West India	20.1	14.6	12.3	20.8	14.5	12.1	32.9	37.2	35.9	22.6	25.1	26.7
Central India	10.0	11.3	12.4	7.2	9.3	10.9	37.0	41.2	41.4	30.3	31.9	31.8
North-West India	9.0	16.7	11.2	6.0	17.5	10.6	38.2	42.5	40.3	23.0	26.3	30.3

7. The registration areas of Categories A & B (it will be seen from TABLE 1) account for nearly three quarters of the population of India. The census growth rates of these areas differ—but only very slightly—from those of the country as a whole. According to TABLE 2, registered births and registered deaths during 1941-50 were as follows

For every 1,000 persons living in these areas during the decade, 272 persons were registered as born during the decade; 194 persons were registered as having died during the decade. Thus 78 persons are shown to have been added to the population during the decade. But the census figures show that the addition was 124 in these same registered areas. The difference of 46 must be attributable to unregistered births; unregistered deaths; net migration; and the difference (if any) between the 1941 Census and the 1951 Census as regards accuracy of enumeration. Is it possible, even approximately, to assess how much of each it is, and to frame estimates of the actual numbers of births and deaths per 1,000 persons of mean population during the decade? This question may be put about India, as well as each of the six zones. The smaller the area about which the question is put, the more difficult it is to answer it. *The primary purpose of the present study is to furnish*

answers to these questions and thus to frame the best possible estimates of 'mean decennial birth rates' and 'mean decennial death rates' during the decade 1941-50 for India and each of its six zones

8. Supposing we do succeed in solving this problem, then we pass on to a second set of questions. According to TABLE 2, the registered birth rate was practically stationary between 1921-30 and 1931-40 (33.7 and 33.8) but fell sharply (to 27.2) during 1941-50. Is that a real fall in actual births, or only a fall in the registration of births? Or is it a little of both, and, if so, how much of each?

Similar questions may be put about the death rates. These questions may be put not only about India but also about the zones.

If we succeed in answering these questions, the next step would be to attempt to ascertain whether, and if so, why, the rates of one zone differ from those of another, and also the cause, which have led to changes in these rates from one decade to another. It is not intended that these further questions should be finally answered in this note. But they indicate why it is so important that the very set of questions—those set out in para 7 above—should be answered with as much certainty as possible.

g. The following materials have been collected and used in an endeavour to answer these questions :

A—Material furnished by the Superintendents of Census operations in States :

- (i) Census statistics of birth-place;
- (ii) Census facts about migration of displaced persons,
- (iii) Other facts locally known and thereby throwing light on the direction and volume of net migration,
- (iv) Results of the Experimental Census of Sample Households, 1952 and locally held sample surveys to secure an estimate of the extent of under-registration in births and deaths and thus compute the annual birth and death rates,

(v) Superintendent's analysis of the census data bearing on the birth rates and death rates; and

(vi) Computation of birth rates and death rates in relation to earlier census data made by Superintendents of census operations.

B. Birth rates and death rates calculated by Mr. S. P. JAIN, the 1951 Census Actuary.

C—Expected birth rates by operation of maternity rates derived from the maternity data of the 1951 Census

The nature of the light thrown by each of these three different types of material is explained successively in Sections III, IV and V. A combined final review is presented in Section VI. Before proceeding to examine these data, it is necessary to consider the basic figures of the total count of population at successive censuses, and determine whether any allowance should be made for error present in them.

II—Allowance for error in Census figures

10 The first Indian Census took place in 1872, but the first of the systematic decennial series of censuses took place in 1881. The area covered by enumeration increased from decade to decade. The efficiency of enumeration also increased. The 1911 Census marked a definitive stage—when the technique of enumeration had been practically perfected and the census covered practically the whole area. This does not, of course, mean that no one was missed and everyone was enumerated without exception. Nor does it mean that fairly important changes in enumeration procedure did not take place later. They did. But the census of 1911 is, nevertheless, a landmark in that the proportion of the number omitted to the number counted had been reduced substantially and a high standard of completeness of enumeration attained, and (subject to certain special considerations set out below) the censuses which were taken subsequently in 1921, 1931, 1941 and 1951 have maintained substantially the same standard so far as the degree of completeness of the count was concerned. The special considerations referred to above are explained below.

11 'Merged Areas'—It is likely that in some of the numerous small States which are

since merged (e.g., in such states as Madhya Pradesh) the present standard of completeness of enumeration was reached somewhat later. Even in such areas, however, the technique was perfected by 1931 and the areas where the census count was significantly incomplete thereafter must be regarded as negligible from an all-India and zonal point of view.

12 The 1921 Census—This census was taken immediately after the influenza epidemic of 1918-19. In some areas where the epidemic was exceptionally severe, some increase in omission is probable.

There was also some difficulty arising out of the 'non-cooperation movement' which does not, however, appear to have developed into a boycott sanctioned by the leaders of the movement. The actual extent to which the census might have been affected in particular areas cannot now be measured. The references to the subject in the old reports indicate that we may safely assume that, while the 1921 Census figures might perhaps have been on the low side here and there the deficiency was not significant at the all-India and zonal levels.

13. The 1931 Census—This census coincided with the second wave of the non-cooperation movement, and this time there was a definite attempt at a boycott. The reports, however, indicate that census enumeration was actually impeded only in small and clearly located parts of West India. There may have been less significant effects of a purely local nature elsewhere also. The net result was much the same as in 1921 for India and the zones. No significant adjustments are necessary for purposes of computing the actual growth rates for these very large units.

14. The 1941 Census—The position was different in 1941, when the Census encountered difficulties of exactly the opposite nature to those of 1931. In parts of Bengal and the Punjab, there was a definite move among quite considerable numbers of Hindus as well as Muslims to make false returns in order to inflate the real numbers. The census authorities were aware of this and took whatever steps lay in their power to counter the move and furnish correct figures. Notwithstanding the steps thus taken, it seems likely that the published figures include an element of net over-enumeration. An attempt has, therefore, been made to assess its probable magnitude.

(a) An estimate of inflation was made by Mr. JAIN, the Census Actuary, and the Superintendent of Census Operations, Punjab. They have based their calculations in part on a statistical study of prior growth, and in part on the totals of a house-list prepared sometime before the competition between communities became a live issue. These calculations

indicate the presence of over-enumeration of the order of 2 or 3 lakhs in that part of the old Punjab Province which is now in India [The Pakistan Census authorities have assessed the over-enumeration in that part of the Punjab which is now in Pakistan at about 9 or 10 lakhs].

(b) A similar estimate was also made for West Bengal. Both the Census Actuary and the Superintendent of Census Operations, West Bengal concur in assessing this over-enumeration as being of the order of 17 lakhs [The corresponding figure reached by Pakistan Census authorities in respect of East Bengal is 37 lakhs]. Having regard to the relative differences in the size of population, all these estimates appear to be reasonably consistent with one another. They are, therefore, accepted.

15. The net result of the special considerations set out in paras 11 to 14 above may be stated as follows: The differences between the population total of successive Censuses since 1911 may be accepted* as correctly representing the actual growth of population during successive decades for India and the zones, subject only to one correction on account of net over-enumeration during the 1941 Census. The actual growth during 1931-40 was smaller by about 20 lakhs than the Census figures indicate. Correspondingly, the actual growth during 1941-50 was larger by about 20 lakhs than the census figures indicate. The figures of columns 2 and 3 of TABLE 2 require to be corrected as shown below.

TABLE 2-A

	Mean Decennial growth rate			
	1931-40		1941-50	
	According to Census of 1931 & 1941	Corrected for over enumeration in 1941	According to Census of 1941 & 1951	Corrected for over enumeration in 1941
East India	14.4	12.3	10.8	12.9
North-West India	16.7	16.0	9.0	9.8
INDIA	13.3	12.7	12.5	13.1

* This is not to assert that the Census figures of 1951, 1931, 1921 etc are free from all error. The population totals of the 1951 Census are known to contain an element of under-enumeration—of which the magnitude has been estimated and published in Census of India Paper No. 1 of 1953. The conclusion reached here is simply that the Census of 1931, 1921 and 1911 contained an element of under-enumeration of substantially the same order, and that the figures of 1941 can be rendered comparable with them by a correction of the order indicated in TABLE 2-A.

III — Material supplied by the Superintendents of Census Operations

[This section contains a brief resume of facts recorded in birth-place tables of States as well as facts and opinion found in draft State Census Reports received from the Superintendents of Census Operations.]

16 Uttar Pradesh— (i) Out of 632 lakhs of persons enumerated in Uttar Pradesh, 14 lakhs were born outside including the displaced persons who numbered 4.8 lakhs. 15 lakhs of persons born in the State were enumerated in other States of India.

(ii) The Superintendent estimated the net migration of the decade as 5.2 lakhs including the displaced persons. [He had not, however, taken into account the displaced muslim emigrants to Pakistan from the state. Another report indicates that this number is approximately of the same order and may, therefore, be set off against the total number enumerated in the state as displaced persons.]

(iii) The Statistical Department of the State Government carried out a sample survey in 1949 in 44 districts (about 200 villages in each district). It was estimated that under-registration of births was of the order of 29.5%, and of deaths 24.3% for the whole state.

(iv) The Superintendent of Census Operations arranged for calculation of the birth rate and death rate by the differencing method. This has led him to the conclusion that during the decade 1941–50 there was under-registration of births to the extent of 28.5% and of deaths to the extent of 32.6%, and that the true birth rate was 34.6 and the death rate was 24.3. [Here again, the reasoning has been affected by the omission to take Muslim emigrants to Pakistan into account, and the conclusions will need revision.]

There is a continuing drop in the birth rate in the State since 1921. The slow changes in the birth rate are mainly attributed to the direct and indirect effects of the alteration of age composition of population and its civil condition. The recent tendency towards a higher age of marriage may tend to lower the birth rate but improvement in maternal health and reduction in the number of widows are likely to have the opposite effect. The main factor that will affect the future trend will be the female proportion at the reproductive ages and the number of married females among them. The figures indicate that the birth rate may maintain the same level as during the decade

1941–50 or may show a slight decline during 1951–60.

17 Bihar— Out of 402 lakhs of persons enumerated in Bihar, 5.6 lakhs were born outside the state (including the Displaced Persons who numbered one lakh). 15.8 lakhs of persons born in the State were enumerated in other States of India.

18. Orissa— (i) Out of a population of 146 Lakhs, 1.97 lakhs were born outside the State. During the last decade there has been some fresh immigration owing to the development of industries and execution of large irrigation projects. The number of displaced persons was about 20,000 and there was no Muslim migration to Pakistan.

The number of persons born in Orissa and enumerated in other parts of India was 416,408. This takes into account the periodic migration of cultivators free from harvests at the time of Census, going to Bengal, Jamshedpur, etc. in search of employment, which has gone to swell the numbers. On the whole emigration is shrinking.

(ii) Efficiency of registration deteriorated during and after the World War II. Under-registration of births may be of the order of 45% to 50% and of deaths from 33% to 40%. The Superintendent concludes that the real birth rate is likely to be 40 and the death rate to be 30. [All this, however, is very much of a guess, though, (as will be seen presently) evidence of a more substantial nature also points to much the same conclusion.]

(iii) There has been a fall in the birth rate. One of the direct causes of fall in the birth rate during the last decade is the decrease in the number of women belonging to the effective child-bearing age group, namely, between 15 and 34. The coming decade will be influenced by the undepleted and full-fledged reproductive age-groups and therefore unless other causes operate the birth rate is likely to increase.

19 West Bengal— (i) Out of the 248 lakhs of people in West Bengal 46 lakhs were born outside the State. This included 21 lakhs

of displaced persons and also 5 lakhs of persons born in Pakistan but not enumerated as displaced persons 3 lakhs of persons born in West Bengal were enumerated in other states.

(ii) The Superintendent of Census Operations, estimate of average birth rate for the period 1941-50 was of the order of 41 to 42. On the basis of an estimate for the survival rate of the non-Muslim population, the death rate has been estimated to be of the order of 27 or 28.

(iii) The Director of Public Health carried out a sample survey in 1948 and obtained data regarding births and deaths and omissions in registration. It is reported that the 'formula of Chandrasekhar and Demming' was applied to these data and the conclusion was reached that a birth rate ranging from 34 to 43 (according to the area considered) and a death rate of about 29 were indicated.

20. Assam—(i) Out of 90 lakhs of persons enumerated in Assam, 77 lakhs were born in the state and 13 lakhs were born outside the state. Among the latter, 8.3 lakhs were born in Pakistan. Among these again, there were 2.8 lakhs who were enumerated as displaced persons. The balance consists mostly of Muslims from East Pakistan who were reported to have gone to Assam in considerable numbers during 1947-51. Assam-born population enumerated in other States of India is very small—about half a lakh.

(ii) Owing to the change of age composition of the people, it is said "Assam has now a larger proportion of infants and young persons than ever before in its history."

21. Madras—(i) Out of 570 lakhs of people enumerated in Madras 564½ lakhs were born in the state and 5½ lakhs were born outside the state. The number of persons born in Madras and enumerated in other states in India (at the 1951 Census) was 12 lakhs. About two-third of this number were found in other states of South India—5.3 lakhs in Mysore, 1.9 lakhs in Travancore-Cochin, and 0.5 lakhs in Coorg.

Emigration from Madras to countries outside India used to be fairly considerable formerly. According to the 1931 Census Report, the number of Madras-born persons living in foreign countries was estimated at 19 lakhs (or rather more than one-half of all the emigrants from the whole of India and Pakistan).

The Superintendent has attempted a similar estimate and has been led to the conclusion that

the corresponding number in 1951 is of the order of 17 lakhs. The order of magnitude of these figures seems to be correct, though they present considerable difficulties as regards the inferences to be drawn from them in respect of the actual direction and volume of movements into and out of the state during the last decade.

The Superintendent concludes his review with the opinion that difference between growth rate in 1941-50 (13.4) and that in 1931-40 (11.0) is not completely accounted for by natural increase; but that it is also due to the fall in emigration to outside countries and the return of emigrants notably from Burma, Ceylon and Malaya.

(ii) The registered birth rate (in 1941-50) is 30.8 and registered death rate is 20.6. The results of the Experimental Census showed an under-registration of births to the extent of 10.7% and under-registration of deaths to the extent of 15.7%. These data indicate a birth rate of 34.1 and a death rate of 23.8. The actual rates are unlikely to be very much higher, since Madras is one of the four states which are known to have a reasonably satisfactory system of registration.

(iii) The Superintendent thinks that the decline in the registered birth rate reflects a real fall in the birth rate, and that this fall is independently corroborated by a fall in the number of children aged 0 to 4 per 1000 married women. The relevant figures are as follows: 1931 (606); 1941 (561) & 1951 (522).

The Superintendent attributes the fall to "the pressure of economic conditions which came to a head during the War". He believes this pressure has made "at least some sections of the population more careful about too many children".

22. Mysore—(i) Out of 90.7 lakhs of people 84.5 lakhs of people were born in the state and 6.2 lakhs of people were born outside the state. The number of persons born in Mysore State and enumerated outside were 1.8 lakhs.

(ii) There are good reasons for believing that the state has received a net inflow of migrants from adjoining states during the decade 1941-50.

(iii) The Health Department staff in the various health centre areas in the state collected Vital Statistics by house-to-house enquiries. "They took special care to secure 100% accuracy."

According to this survey the crude birth and death rates were found to be 39.5 and 15.6 respectively in these areas. These rates tally with those of Ceylon which has recorded a very similar rate of population growth. The Superintendent considers that these rates are reasonable. He also refers to the view that there has been a deterioration in the efficiency of registration during World War II and since.

(iv) The outlook for 1951-60 is a higher birth rate than the decade 1941-50. The age-groups depleted by influenza and famine have passed beyond the child-bearing period. The future maternity age-groups will be undiminished in strength and will also be "assured of a higher rate of survival than at any time before in the history of Mysore." The rate of increase during 1951-60 is likely to touch even higher levels than 1941-50.

23 Travancore-Cochin—(i) Out of 93 lakhs of people in Travancore-Cochin 2 lakhs were born outside the state. 2 lakhs of people born in Travancore-Cochin were enumerated outside the state.

(ii) In 1948, the Department of Public Health conducted a survey in 30,535 houses scattered over 303 centres. The birth and death rates according to the survey were 34.9 and 11.4. The natural growth rate comes to 23.5 which is "more or less in agreement with Census growth rate of 21.2." Standardised death rate for the urban population of Trivandrum district for 1931 and 1941 was reached by applying the age distribution of the present Census to the age specific mortality rates. The mean of the two rates was 14.7. The Superintendent assumes that registration is practically complete in the urban areas of Trivandrum. Though this figure of 14.7 is low, there are good reasons for believing that the health standards are significantly higher and death rate significantly low in this State. Hence, he adds the growth rate to the death rate thus arrived at, the birth rate is deduced to be 35.9.

24 Bombay—(i) Out of 360 lakhs of people in Bombay, 22.5 lakhs of people were born outside the state. There were 3.4 lakhs of displaced persons. 4.4 lakhs of people born in Bombay were enumerated outside the state. 'Immigrants' have increased in number since

the 1931 Census, while the number of 'emigrants' has gone down.

(ii) There are good reasons for assuming a fairly substantial net inflow of migrants into the state during 1931-50.

(iii) The experimental census of births and deaths in sample households has disclosed an under-registration of 17.7% of registered births and 16.4% of registered deaths. If the registered rates for 1931-50 are increased by these percentages, then the following figures are obtained: Birth rate—38.7; and death rate—26.0.

25 Madhya Pradesh—(i) Out of 212.5 lakhs of people in Madhya Pradesh 205.2 lakhs were born in the state and 7.3 lakhs outside the state. The pattern is the same as at the earlier census except for immigration of displaced persons which was over a lakh. 4.6 lakhs of persons born in Madhya Pradesh were enumerated outside the state. Calculations during the decade 1921-50, show that there has been a net inflow of migrants both during 1921-30 and 1931-50, but the magnitude of the movement is small—rather less than one lakh per decade.

(ii) The experimental census of births and deaths in sample households held in 1952 has recorded an under-registration of 10.3% of registered births and 14.2% of the registered deaths. The registered birth rate and death rate for Madhya Pradesh for the decade 1941-50 were 37.0 and 30.3. These data indicate a birth rate of 41.8 and a death rate of 34.6. Madhya Pradesh is one of the four states categorised as 4, and the true rates are, therefore, not likely to be much in excess of these figures.

(iii) The Superintendent of Census Operations has examined the subject at considerable length and reached the conclusion that the trends as well as the differences in the trends occurring in the three different divisions of the state are clearly correlated to changes which have been occurring in the age-sex structure. He has also examined why these latter changes occurred and finds them to be the after effects of heavy abnormal mortality in the past in years of famine and influenza. The conclusion is reached that the birth rate is likely to remain substantially the same during 1951-60 as during 1941-50.

26 Madhya Bharat—Out of 79.5 lakhs of people in Madhya Bharat, 73.8 lakhs were

born in the State and 5.7 lakhs outside the State. This included 64,000 displaced persons from Pakistan. 3.3 lakhs of persons born in Madhya Bharat were enumerated outside the State. [This State is categorised as D]

27 Hyderabad— Out of 187 lakhs of persons in Hyderabad 183 lakhs were born in the State and 4 lakhs were born outside the State 6 lakhs born in Hyderabad State were enumerated outside. [This State is categorised as C]

28 Vindhya Pradesh—Out of 35.7 lakhs of people in Vindhya Pradesh 34.8 lakhs were born in the State and 0.9 lakhs outside the State Able-bodied persons are reported to go out when the ploughing operations are over (September-October) and return by the middle of July. The extent of this purely temporary migration is not known. [This State is categorised as D.]

29 Rajasthan—(i) Out of 152.9 lakhs of people in Rajasthan 146.4 lakhs were born in the State and 6.5 lakhs outside the State. This included 3.0 lakhs of displaced persons 9.3

lakhs of people born in Rajasthan were enumerated in other States

(u) The net result of the analysis of the age structure tends to show that the birth rate is likely to show a slight rise during 1951-60 [This State is categorised as D]

30. Punjab— (i) Out of 124 lakhs of people in Punjab, 98 lakhs were born in the State and 26 lakhs outside the State This included 23 lakhs of displaced persons, 9 lakhs of persons born in Punjab were enumerated outside

(ii) The Experimental Census of Births and Deaths in Sample Households held in 1953 has recorded under-registration amounting to 14.7% of registered births and 18.1% of registered deaths The registered birth rate and death rate for Punjab during 1941-50 were 39.5 and 23.9 respectively. If the under-registration percentages as revealed by the Experimental Census are applied, a birth rate of 45.3 and death rate of 28.2 are indicated [This State is categorised as A] The actual birth and death rates are unlikely to be much higher than the figures above mentioned

IV — Result of study by Census Actuary

31. Shri S P JAIN, the Census Actuary who prepared the life table from the 1951 Census data was also asked to compute the birth and death rates for the decade 1941-50 for different States and India from the available material Shri JAIN has calculated the death rate and the birth rate by the 'differencing method' and also the birth rate by the 'reverse survival' method. From these data he has computed the birth and death rates for the various States. A detailed note has been prepared by Shri JAIN setting out the data used by him and the methods of calculation

adopted The note is printed as *Annexure II*. Shri JAIN has taken note of the material supplied by Superintendents of Census Operations, has commented on the errors, omissions and other factors which raise doubts and difficulties about the assessment of migration change Shri JAIN's conclusions are set out in TABLE 3 on next page The rates finally suggested by his study are given in columns 2 & 3 of the Table These figures give a birth rate of 39.9 per thousand and a death rate of 27.4 per thousand for Part A States

TABLE 3

Zone and State	Estimate based on Differencing method		Estimated Birth rate based on Reverse Survival method
	Death rate	Birth rate	
1	2	3	4
North India			
Uttar Pradesh	27.2	38.6	37.1
East India			
Bihar	26.6	39.0	42.2
Orissa	29.9	37.2	39.3
West Bengal	28.6	35.4	35.3
Assam	31.8	46.7	49.8
South India			
Madras	22.8	35.7	34.7
Mysore	18.9	36.9	38.7
Travancore-Cochin	18.0	37.4	39.8
Goorg	18.6	38.7	38.7
West India			
Bombay	24.9	41.0	41.8
Saurashtra (including Kutch)	24.9	42.2	42.4
Central India			
Madhya Pradesh	38.5	46.1	45.1
Madhya Bharat	35.8	44.2	44.3
Vindhya Pradesh & Bhopal			
Hyderabad	29.5	43.1	47.2
North-West India			
Rajasthan	27.2	42.5	47.9
Punjab	26.3	41.3	40.8
PEPSU, Bilaspur & Himachal Pradesh			
Amar	31.3	41.5	37.9
Amrit	38.0	45.0	46.5
Delhi	26.3	41.2	41.1
ALL-INDIA	27.4	39.9	39.2

V -- Maternity Data of the 1951 Census

32. Maternity data were collected in Travancore-Cochin and three divisions of East Madhya Pradesh, as part of the 1951 Census Operations. Similar data (though on a much smaller sample) were also collected in the rural areas of two groups of districts* of West Bengal in the course of training of census enumerators and Super-

visors. From the maternity data collected in these places, child birth indices and age specific maternity rates for married females aged 15-24, 25-34 and 35-44 were worked out. For a full description of these data as well as the methods of calculation adopted reference should be made to Census of India Paper No. 5 of 1953 'Maternity Data—1951 Census'. A note on the logistic graduation of maternity data, and derivation of table of age specific maternity rates, (printed as Annexure I in that Paper) is reproduced in Annexure III to this note.

It will be seen from this paper that upper limit estimates of birth rates were framed for the decade 1941-50 as below :

Travancore-Cochin . . .	36.8
East Madhya Pradesh . . .	46.4
North-West Madhya Pradesh . . .	41.7
South-West Madhya Pradesh . . .	43.5
West Bengal (I) . . .	35.5
West Bengal (II) . . .	37.4

33. It cannot be assumed that the child bearing habits of mothers in one part of India are the same as those of mothers in another part of India. But if we apply the age specific maternity rates obtained for the areas mentioned above to the age structure of married females in India, the zones and Part A States, we obtain a range of expected birth rates for the decade 1941-50 as shown in TABLE 4 below :

TABLE 4

Expected birth rates—by applying the maternity rates of						
India, Zone and State	Travancore Cochin	East Madhya Pradesh	North-West Madhya Pradesh	South West Madhya Pradesh	West Bengal (I)	West Bengal (II)
I	2	3	4	5	6	7
INDIA . . .	42	43	38	42	35	36
North India . . .	43	44	39	43	36	37
East India . . .	42	43	38	42	35	36
South India . . .	41	42	37	41	34	35
West India . . .	43	44	39	43	36	37
Central India . . .	44	46	40	44	37	38
North-West India . . .	41	42	37	41	34	35
STATES						
Uttar Pradesh . . .	43	44	39	43	36	37
Bihar . . .	42	43	38	42	35	36
Orissa . . .	43	43	39	43	36	37
West Bengal . . .	41	43	38	41	35*	38*
Assam . . .	39	40	35	39	33	33
Madras . . .	42	42	38	41	35	36
Bombay . . .	43	44	39	43	36	37
Madhya Pradesh . . .	43	44	39	43	36	37
Punjab . . .	38	39	35	38	32	33

VI — Combined final review of all available material

34. The first part of the problem as set out in first Section of this note is to ascertain whether definite figures can be arrived at which may be regarded, with reasonable probability, as representing actual average birth rate and actual average death rate during the decade 1941-50. The nature of the material, which has been described already, indicates clearly

* These rates have been obtained by applying the Maternity Rates of West Bengal (I) and (II) to the married females of the corresponding sample districts of West Bengal.

that the most difficult part of the analysis lies in assigning a value for the effect of net migration and isolating it. The difficulties are specially accentuated by the fact that birth place data collected at the 1941 Census have not been tabulated for most States. A great many territorial changes have occurred and the movement of large masses of displaced persons has to be taken into account. While these difficulties are real they do not disable us altogether from arriving at reasonably clear conclusions. This is especially true when these conclusions are limited to

India and the Zones. The scope of this note, as mentioned already, is limited accordingly.

35 (i) The number of partition displaced persons from Pakistan enumerated at the 1951 Census in India was about 72 lakhs. In addition, nearly 12 lakhs of Pakistan-born persons have been enumerated in East India. From the Pakistan Census Bulletin No. 1 of 1952, it is found that nearly 71.5 lakhs* of displaced persons from India were enumerated in Pakistan. These figures indicate that the number of uprooted people who migrated from one country to another were very nearly the same. *The net result of the abnormal movement of partition displaced persons is statistically negligible as a component part of the growth rate of the decade 1941-50, so far as the country as a whole is concerned.* That is an important conclusion which simplifies further analysis to a large extent.

(ii) So much for one type of abnormal movements. There was another, earlier in the decade, shortly after Japan entered the War and overran Malaya and Burma. Large number of Indians who had emigrated to these countries earlier returned to India at that time. A special count of these migrants was made under the Asiatic British Evacuees Census Order, 1943 issued by the Government of India under Rule 24 (a) of the Defence of India Rules. The total number of migrants counted at that Census was 3.9 lakhs, of whom 2.7 lakhs came to the present territory of India. Of this total of 2.7 lakhs, 1.6 lakhs went to South India and nearly half a lakh to East India and less than half a lakh to North India. In the other three zones, the numbers were negligible. There are some reasons for believing that this count was not complete.

* The Pakistan Census figures for displaced persons from India are not yet available by 'state of origin'. A tentative allocation has been made of these figures on a zonal basis (with reference to tentative estimates made by Census Superintendents) as shown below.

	In lakhs
North India	5.8
East India	7.6
South India	
West India	1.2
Central India	0.8
North-West India	56.1
	71.5

The migrants who were not counted, it was thought at that time, might have been one lakh.

36. In the past, India was an emigrating country. At the time of 1931 Census, nearly 35 lakhs of Indians were living in other countries including Burma, while the number of persons born in other countries and enumerated in India was only 7 lakhs. The figures relate to undivided India, the share of the territory now in Pakistan is likely to be small in respect of emigrants.

The number of persons born in other countries and enumerated in India according to the 1951 Census was 87 lakhs, which included 82 lakhs of persons born in Pakistan. The remaining 5 lakhs were born in other countries. The figures indicate that changes, if any, in the movement of foreign-born persons into and out of India are quite insignificant in relation to the growth of population. What is the position regarding movement of India-born persons to and from foreign countries (other than Pakistan)?

It has been seen already that there was one abnormal influx in or about 1942, of which the size (so far as India within its present boundary was concerned) was of the order of about 4 lakhs. To what extent should that figure be added to or diminished on account of normal movements? According to the latest figures available, the combined total of Indians and Pakistanis living abroad appears to be of much the same order as in 1931. If allowance is made for natural increase in the numbers of the 1931 emigrants it is to be presumed that there must have been a net inflow of returning emigrants into India. It is also well known that there has been no significant emigration from India to countries other than India after 1931. Restrictions were imposed by different countries on immigration from time to time. On the whole it is safe to suppose that the direction of these normal movements during the decade was a net inflow rather than a net outflow, and its size was unlikely to exceed one or two lakhs if the abnormal inflow was only of the order of 4 lakhs. Assuming that the total net inflow was as much as 6 lakhs during 1941-50, it would account only for a couple of decimal points in the all-India growth rate of the decade. Indeed, it would be necessary to postulate a net inflow of well over 16 lakhs, if it is to account for just one half of one per cent of the all-India growth rate. This is, on all the evidence, a very unlikely figure.

Thus we are led to the conclusion that the all-India growth rate must be substantially the same as the all-India rate of natural increase or the excess of the all-India birth rate over the all-India death rate.

This is an important conclusion, as it helps to simplify further analysis

37. TABLE 5 gives an extract of birth place statistics of the 1951 Census as compiled for the six zones and for all-India

TABLE 5

(FIGURES IN LAKHS)

Born in	Enumerated in						India
	North India	East India	South India	West India	Central India	North-West India	
North India . . .	618	5		3	3	5	634
East India . . .	2	852			1		856*
South India . . .		1	753	4	2		760
West India . . .			1	387	3		391
Central India . . .	2	1	1	5	509	1	520*
North-West India . . .	4	2		3	3	308	318*
Pakistan . . .	5	38		4	2	33	82
Other Non-Indian territories . . .	1	2	1	1			5

38 We have now to make a broad assessment of the net migration factor for each zone, being helped by the following main considerations

(a) the assessment for each zone should be relatable to the order of magnitude of the figure for that zone in TABLE 5

(b) the combined result for India should be a very small net inflow of the order mentioned in para 36

The resulting assessment of net migration during the decade 1941-50 is given in the table below

TABLE 6

Zone	Estimate of probable migration (IN LAKHS)	Net emigration (-) / Net immigration (+) (MEAN DECENNIAL RATE)	Mean decennial rate of natural increase
North India			+11
East India	+10 to +15	+1.2 to +1.8	+11 or +12
South India	+3 to +4	+0.4 to +0.6	+15
West India		+14	+16
Central India			+10
North-West India	-20 to -25	-6.0 to -7.5	+16 or +17
INDIA	+7 to +8		+13

*Small discrepancies in totals due to rounding.

39 The following comments are offered by way of further explanation of the figures in TABLE 6

(i) *North India & Central India*—The movement of partition displaced persons was approximately the same in both directions so far as North India is concerned. They are negligible in both directions so far as Central India is concerned. The birth place statistics indicate that inter-zonal movements of a normal character are relatively small and the net balance one way or another may be ignored.

(ii) *East India*—This is a very difficult zone to assess, but there are a number of converging considerations. The birth place table shows that there were 38 lakhs of immigrants from Pakistan against 26 lakhs returned as displaced persons. According to Pakistan Census authorities there were nearly 15-20 lakhs of immigrants from India in East Pakistan against 7 lakhs returned as displaced persons. Out of those who did not return themselves as displaced persons, it is not clear how many migrated during the decade. Apart from partition movements between East India and East Bengal, there must have been some movement from other zones to East India. Taking all these into consideration, it is estimated that East India should have received a net inflow during the period to the extent of 10 to 15 lakhs.

(iii) *South India*—South India used to send out emigrants to Ceylon and Burma and other countries in larger number than all other zones of India and Pakistan put together. But this has been drying up since 1931 and has more or less ceased. On the other hand, a reverse movement has been proceeding at the same time of which the arrival of large numbers from Burma in or about 1942 was the most conspicuous. [There are fairly important trends of internal movement within the zone, but they need not concern us.] The net migration position, it is fairly clear, is an *inward* movement. It is probably of the order of 3 to 4 lakhs.

(iv) *West India*—West India has had a net inflow of partition displaced persons of the order of 4 lakhs. The birth place statistics show that in the zone there are nearly 15 lakhs of immigrants against 4 lakhs of emigrants. There is little doubt that during the last decade West India has been attracting immigrants from other zones to an even larger extent than in the past.

But it is difficult to locate the sources and define the magnitudes precisely. Whereas in respect of India and some of the zones, it is possible to use an assessment of the migration factor as one of the considerations in fixing the birth rate and death rate, it is necessary—in respect of West India—to do the opposite. Here information regarding births and deaths has to be considered first and a figure for net migration is fixed so as to be consistent with it. Hence the assumption of 10 lakhs of net inflow from other zones, in addition to 4 lakhs of displaced persons from Pakistan.

(v) *North-West India*—Thirty three lakhs of persons born in Pakistan have been enumerated in North-West India. It is estimated that 56 lakhs of emigrants have gone to Pakistan. The difference is a net loss of 23 lakhs. The migration between North-West India and the other zones during the decade may be reasonably regarded as negligible. Hence the assumption of a net outflow of the order of 20 to 25 lakhs.

This is confirmed independently by the following consideration. The gain in East India, South India and West India for the decade has already been estimated at 27 to 33 lakhs. The assumption made in respect of North-West India leads to a net migration position for India of the order of 7 to 8 lakhs, from what has already been stated in paras 32 to 36 this is just about right.

40 We thus reach the position that the net effect of migration is allowed for, and the true rates of natural increase are settled as in column 4 of TABLE 6. That is to say, the natural increase rate was 13 per cent for the country as a whole during 1941-50. Three zones had lower rates, *viz.*, Central India (10), North India (11), and East India (11 or 12). The other three zones had higher rates. South India (15), West India (16) and North-West India (16 or 17). What is the break-up of these rates into birth rates and death rates? This question is answered zone by zone and finally for India in the next seven paragraphs. In every case, the best conclusion to be reached, on available evidence, about the birth rate is first settled. The value for the death rate follows.

41 *North India*—Shri S P JAIN, has reached three figures for the birth rate—38.6, 37.1 and 35.9. He rejects the last and prefers the first as the best estimate. The Superintendent of

Census Operations had originally estimated the birth rate at 34.6 allowing 28.5% for omissions in birth registration. He has since agreed that his figure must be raised for the reason that he took into account the number of displaced persons in Uttar Pradesh but not the emigration of Muslims to Pakistan.

The birth rate for Uttar Pradesh derived from the maternity rates of North-West Madhya Pradesh and West Bengal (II) work out to be 39 and 37 respectively. On a *priori* grounds, it seems likely that child bearing habits in Uttar Pradesh approximate more nearly to North-West Madhya Pradesh than to West Bengal. On the whole, there is fairly convincing evidence to the effect that the birth rate of North India (for 1941-50) must be 38 to 39. Since the rate of natural increase has been fixed at 11, the death rate should be between 27 and 28.

42. *East India*—(i) *BIHAR*—There is no material other than the rates derived from maternity rates and Shri S. P. JAIN's estimates. The maternity rates of North-West Madhya Pradesh give 38 as the birth rate of Bihar. Both the West Bengal maternity rates give somewhat lower figures, viz., 35 and 36. Shri JAIN's estimates are 39 by differencing method and 42 by the reverse survival method. He prefers the former. This independently seems to be probable. If maternity rates in North Bihar and South Bihar division follow the Uttar Pradesh pattern (assumed to be substantially the same as the North-West Madhya Pradesh) and if the Chhota Nagpur division of Bihar follows the same pattern as East Madhya Pradesh, the resulting rate is almost exactly 39. Hence 39 is accepted as a figure for Bihar, at any rate for use in building up the East India birth rate.

(ii) *ORISSA*—Shri JAIN has arrived at two figures—37.2 and 39.3—and prefers the former which is based on the differencing method. The latter is based on the reverse survival method. There are some reasons which indicate that the higher figure is perhaps nearer the truth. The application of maternity rates of other areas to Orissa leads to the following results. If the maternity pattern of East Madhya Pradesh (which seems to be suitable for Chhota Nagpur division of Bihar) is also accepted as suitable for the Inland Division of Orissa, and if either of the two West Bengal patterns is accepted as applicable to the Coastal Division of Orissa, the resulting birth rate is 39 or 40. This was also

the figure mentioned independently by the Superintendent of Census Operations (albeit on grounds which were little better than a guess). On the whole 39 (which is the higher of the two figures reached by Shri JAIN) is indicated as the birth rate of Orissa and accepted accordingly.

(iii) *WEST BENGAL*—The Superintendent's estimate of the birth rate is 41 or 42. He has, however, also stated that the application of "Chandrasekhar and Deming formula" to the results of a survey conducted by the Director of Health Services in 1948, indicates a birth rate having a wide range from as low as 34 to as high as 43 according to the area considered. The maternity rates for the two groups of districts in West Bengal give the birth rates as 35.5 and 37.4 respectively. Shri JAIN's estimate is 35.4 according to differencing method and 37.4 according to reverse survival method. The latter is reduced to 35.3 after adjustment. Shri JAIN prefers 35.4 as his computed rate. But, on a *priori* grounds, there is justification for placing greater reliance on the higher figure given by the reverse survival method in those cases where there is room for much uncertainty about the migration element. As it happens, this is the case in West Bengal. The reverse survival method yields the higher figure, otherwise indicated as more probable. In the circumstances, 37 is accepted as the birth rate for West Bengal for use in building up the East India Birth Rate.

(iv) *ASSAM*—Available data are so scanty and also so defective that no statement whatever can be hazarded about the birth rate of Assam.

(v) *ZONE AS A WHOLE*—The zonal birth rate may be taken to be the weighted mean of the birth rates (mentioned already) as accepted for Bihar, Orissa and West Bengal, the figure for each state being weighted by the mean population of the state. We thus get the zonal rate as either 38 or 39. (This is the same as the conclusion already reached for North India.) Since the natural increase of East India has been fixed as 11 or 12, the death rate must be either 26, 27 or 28.

43. *South India*—(i) *MADRAS*—Shri S. P. JAIN's estimates of the birth rate are 35.7 according to differencing method and 34.7 according to reverse survival method and he prefers the former. The registered birth rate, corrected for under-registration as assessed by the Experimental Census yields a figure of 34.1. The

true figure must be above this—but not perhaps very much higher, since Madras is categorised A. If the West Bengal pattern is applied to the age-sex-marital status structure of Madras, we get 35 or 36 as the birth rate. If the higher maternity pattern of Travancore-Cochin is applied, the result would be very much higher viz., 42. If we accept Shri JAIN's estimate and fix the birth rate as 36, it would follow that the maternity rates for Madras (as a whole) are substantially lower than in Travancore-Cochin, and not very dissimilar to those prevailing in West Bengal and the Coastal division of Orissa. This must well be the case. The birth rate for Madras is therefore taken to be 36.

(ii) MYSORE.—The Superintendent's estimate of the birth rate is 39.5. Shri JAIN's estimates are 36.9 according to the differencing method and 38.7 according to the reverse survival method. As will be seen below, the Travancore-Cochin birth rate is fairly clearly established as 37. On *a priori* grounds, it seems unlikely that the Mysore rate will be higher than Travancore-Cochin, but the possibility cannot be ruled out. A special enquiry (carried out jointly by the Government of India and the United Nations) has been recently concluded in this state. The result of this enquiry is not yet available. For present purposes—viz., the making of an assumption about Mysore, in order to build up the South India birth rate—it is assumed that anything between the two figures stated by Shri JAIN, is possible. The birth rate may be 37, 38 or 39.

(iii) TRAVANCORE-COCHIN.—The birth rate is 37.4 by differencing method and 39.8 by reverse survival method. The Public Health Department had reached a figure of 34.9 by an estimate of under-registration of births. As omissions are known to be numerous in this State, even a corrected registration figure must be somewhat on the low side. The true birth rate—there is little doubt—must be not less than 35. The Superintendent estimates the birth rate at 35.9, on the basis of death registration data for urban areas in Trivandrum district which are stated to be complete. The maternity data yield the rate of 36.8. There is thus converging testimony of a fairly convincing nature pointing to 37 as a good estimate of the birth rate. It is accepted accordingly.

(iv) ZONE AS A WHOLE.—The zonal rate may now be fixed, as the weighted mean of the rates

for Madras, Mysore and Travancore-Cochin. We get 36 or 37 as the birth rate for the zone. The natural increase rate is 15. The death rate is therefore 21 or 22.

44. West India.—The rates to be fixed for the zone must be the same as those for Bombay—since there are no registration data for Saurashtra and Kutch and since Shri JAIN's estimates are substantially the same for Bombay and Saurashtra. Shri JAIN's differencing method gives 41 as the birth rate for Bombay, while the reverse survival method gives 41.8 as the birth rate. He prefers 41. The figures for Saurashtra are 42.2 and 42.4. If the whole of West India had the same maternity pattern as South West Madhya Pradesh, the birth rate would be 43. On the other hand, if North-West Madhya Pradesh pattern were in force, the birth rate would be 39. The registration data for Bombay (corrected for omissions on the basis provided by the Experimental Census) yield a birth rate of 39, and a death rate of 26. It is impossible to accept both figures as simultaneously corrected, the reason being that, in that case, the natural increase rate would be only 13, and we should be forced to assume a net migration of the order of 25 lakhs. It is not possible satisfactorily to locate sources from which movements in such numbers could have taken place within a decade. The best conclusion to be drawn from available data would appear to be: (a) a zonal birth rate of 42, (b) a zonal death rate of 26, and (c) a net inflow by migration into the zone of about 10 lakhs from other zones in India, in addition to 3 lakhs of displaced persons from Pakistan *vide* para 39 (iv) above. It will be noted that a birth rate of 42 is Shri JAIN's higher figure based on reverse survival. As already mentioned, there is justification for preferring it in those cases where assumptions about migration are relatively important as well as uncertain. The choice of 42 involves also the corollary that the maternity rates of West India are a shade below those of South West Madhya Pradesh and distinctly higher than those of North-West Madhya Pradesh. There is nothing impossible about this corollary, in view of the known composition of the people in those areas it is indeed quite credible.

45 Central India.—(i) MADHYA PRADESH.—Shri S. P. JAIN has arrived at two rates 45.1 and 46.1. Maternity data

yield the following birth rates for the three divisions of Madhya Pradesh :

East Madhya Pradesh . . .	46.4
North-West Madhya Pradesh . .	41.7
South-West Madhya Pradesh . .	43.5

The average rate for the entire state is 44.4. There is thus a good case for accepting 44 or 45 as the correct figure of the birth rate. There is however a difficulty. Madhya Pradesh, as mentioned already has a reasonably satisfactory registration. The registered birth rate is 37.0. According to the Experimental Census, omissions are 10.3% of registered births. This would yield only a true birth rate of 41. If 44 or 45 is correct, then the omissions must be of the order of 20%. On the whole, the weight of evidence of three entirely distinct methods of computation should be preferred, and birth rate of 44 or 45 adhered to. It would then follow either that the Experimental Census was rather less complete in the detection of omissions than would be expected in a state categorised as A or alternatively that the registration of births is better this year as compared with the decade 1941-50. The latter is the more probable inference, because it is known that there was some deterioration during the War and the first few post-War years and there has been an opportunity in recent years to bring about improvement.

(i) MADHYA BHARAT, VINDEHYA PRADESH AND BHOPAL.—The birth rate according to Shri JAIN's differencing method and the reverse survival method are practically identical and the rate is 44. There are no other data. This figure (44) is accordingly accepted.

(ii) HYDRABAD.—The birth rate reached by Shri JAIN through the differencing method is 43.1. According to the reverse survival method the figure is 47.2. The former seems to be preferable for the reason that Hyderabad is unlikely to have a higher birth rate than Madhya Pradesh. It is probably intermediate between Madhya Pradesh and Bombay 43.18, therefore, accepted as the birth rate for Hyderabad.

(iv) ZONE AS A WHOLE.—The birth rates above mentioned for individual states yield a zonal birth rate of 44. The natural increase rate is 10; and hence the zonal death rate must be fixed as 34.

46 North-West India.—(i) PUNJAB—birth rate arrived at by Shri S. P. JAIN is 41.2 according to differencing method and 37.6 according to the reverse survival method. The latter figure is revised to 40.8 after adjustment. Shri JAIN prefers the first. The application of maternity data to the age-sex-marital status of the Punjab (both in 1941 and in 1951) leads to the following results.

If the Punjab pattern follows that of South-West Madhya Pradesh, the birth rate would be 39.8. If the East Madhya Pradesh pattern is applicable, the birth rate would be 41.1. On the other hand, if the pattern is the same as in North-West Madhya Pradesh (which, by assumption, is much the same as that of Uttar Pradesh) the birth rate could be only 36.4. Thus the indications given by the maternity rates are consistent with Mr JAIN's results—but there is no clear ground for preferring the higher figure to the lower.

When we turn to the registration data for an indication on this point, a difficulty arises, because they point to a higher level than the figure 41. The registered birth rate for 1941-50 is 39.5. The Experimental Census of Births and Deaths held in 1952 indicates omissions in births of the order of 14.7% of registered births. If this was true of the decade as a whole, the birth rate would be as high as 45.9. Could this possibly be correct? Apparently not, because a careful computation made by the Superintendent of Census Operations, Punjab who reported on the 1931 Census showed a birth rate of only 43.9 for the decade 1921-30. It is very unlikely that the true figure for 1941-50 would exceed it—when the trend is the other way about almost everywhere else.

How are we to reconcile a birth rate figure which does not appreciably exceed 41, with a registered birth rate of 39.5, to which must be added something on account of omissions, even if it be not 14.7%? The explanation seems to lie in the mass movements of population which took place in 1947, and which resulted in a net reduction of numbers during the last three years of the decade. This is a peculiar circumstance affecting the Punjab and it is calculated to yield an exaggerated figure as the registered birth rate, because the arithmetical mean of the population in the years 1941 and 1951 must be smaller than the actual average of the mean population from year to year during the decade.

[The registered death rate must also be exaggerated for the same reason.]

If we allow for this peculiarity, it is seen that Shri JAIN's figure of 41 is adequately corroborated and may be accepted as the birth rate of the Punjab.

(ii) REST OF THE ZONE—The data available for the rest of North-West India are exceedingly sketchy. Shri JAIN has been unable to reach any definite opinion, but has mentioned the following birth rates:

State	Difference Method	Reverse Survival Method
Rajasthan	42.5	47.9
Bilaspur and Himachal Pradesh	41.5	37.9
Ajmer	45.0	46.5
Delhi	41.2	45.6

(iii) ZONE AS A WHOLE—If we consider the figures in the light of the Punjab birth rate fixed at 41, the zonal birth rate for North-West India may be fairly taken to be 41 or 42. As the natural increase rate is fixed already at 16 or 17, the zonal death rate must be 24, 25 or 26.

47 Rates for India—The rates for India may now be fixed as the weighted mean of the

rate for the six zones. The result is a birth rate of 40, and death rate of 27, and growth rate of 13 for the decade 1941-50 for the country as a whole.

TABLE 7 gives, the birth rates, the death rates and the natural increase rates for the six zones and for all-India.

TABLE 7

India and Zones	Mean Decennial Rates (1941-50)		
	Birth	Death	Natural Increase
North India	38-39	27-28	11
East India	38-39	26-27-28	11 or 12
South India	36-37	21-22	15
West India	42	26	16
Central India	44	34	10
North-West India	41-42	24-25-26	16-17
INDIA	40	27	13

The figures of this table furnish the answers to the questions posed in para 7 of this note—with as much certainty as the nature of available evidence permits.

48 The following table shows the assessment of under-registration of birth rates for individual states arranged in order of their efficiency of registration.

TABLE 8

State	Mean Decennial Birth Rate		Percentage of unregistered births to estimated total number of births
	Registered	Estimated	
Punjab	39.5*	41	under 13
Madras	30.8	36	25
Madhya Pradesh	37.0	44-45	16 to 18
Bombay	32.9	42	22
Orissa	28.2	39	28
Uttar Pradesh	24.8	38-39	35 to 36
Bihar	21.9	39	44
West Bengal	20.5	37	45
Travancore-Cochin	20.3	37	45
Mysore	16.2	37 to 39	Over 50

* This figure needs revision for reasons set out in para 46 (i).

ANNEXURE I

Mean Decennial Growth Rate

ANNEXURE

Mean decennial growth rate during

	Mean Population of decade			Mean Population of decade for area under registration of Births and Deaths		
	1941-50	1951-60	1961-70	1941-50	1951-60	1961-70
	2	3	4	5	6	7
	335,842,031	294,962,755	261,633,608	250,395,171	222,958,843	198,928,118
	59,873,795	52,950,504	48,062,327	58,473,509	51,714,550	46,891,851
	85,520,764	75,465,814	66,434,604	75,744,434	66,744,738	58,733,204
	70,219,076	61,262,039	54,710,864	61,828,835	54,358,133	49,061,406
	36,955,421	30,933,387	27,056,170	22,327,147	21,029,217	18,402,266
	49,770,923	44,741,680	39,747,818	17,423,992	16,053,050	14,519,032
	33,469,682	29,497,715	25,593,550	14,597,254	13,059,155	11,320,309
di	32,370	31,616	28,275			
eh	59,873,795	52,950,504	48,062,327	58,473,509	51,714,550	46,891,851
in	2,383,316	2,109,584	1,898,675	1,978,610	1,736,113	1,564,681
	16,957,939	15,170,051	13,826,610	16,472,544	14,748,701	13,449,544
	15,217,534	13,418,754	12,225,508	15,217,534	13,418,754	12,225,508
h	21,542,957	19,038,752	17,200,147	21,033,774	18,567,619	16,740,731
	2,771,047	3,243,363	2,911,392	3,771,047	3,243,363	2,911,392
	35,377,033	34,542,179	30,866,767	38,174,360	34,346,156	30,697,207
	17,441,948	15,932,624	14,595,382	17,441,948	15,932,624	14,595,382
	10,523,775	9,191,013	8,081,345	10,523,775	9,191,013	8,081,345
	10,411,310	9,418,542	8,240,040	10,208,637	9,222,519	8,070,430
	14,206,967	13,129,822	11,824,821	7,753,569	7,285,289	6,582,345
	7,667,630	6,940,701	6,072,941	1,864,640	1,676,007	1,335,585
	6,119,137	6,185,818	5,751,880	5,888,929	5,609,282	5,249,760
7c)	23,123,802	19,750,361	17,032,132	22,667,802	19,134,497	16,440,444
nd	1,046,924	1,756,297	1,609,487	1,290,934	1,140,433	1,017,800
s	21,422,964	18,026,837	15,448,988	21,376,867	17,994,064	15,422,645
	8,318,372	6,968,747	5,830,523			
	7,148,723	5,978,796	5,013,203	7,148,703	5,978,796	5,013,203
	1,179,649	959,951	817,315			
	544,852	475,533	414,811			
	576,020	447,730	343,443			
	129,622	115,664	95,764			
	53,473,375	47,240,116	42,621,002	53,473,375	47,240,116	42,621,002
	4,712,777	4,201,064	3,755,317	4,759,678	4,263,064	3,855,317
	2,171,125	1,957,452	1,772,157	6,240,106	5,367,462	4,772,157
	274,741	12,577,743	10,800,811	13,557,438	12,079,743	10,800,811
	2,116,913	2,127,455	23,192,716	2,125,953	25,529,846	23,192,716
	8,206,395	6,953,891	6,276,572	8,206,395	6,953,891	6,276,572
	170,241	6,717,276	5,449,403	8,390,241	6,903,906	5,649,403
	199,775	166,024	143,582	199,065	166,026	143,582

The figures for the areas of Category 'C' are not required as they are not included in the figures for the areas of Category 'C'.

three decades—General Population

State and Division	Mean Population of decade			Mean Population of decade for area under registration of Births and Deaths		
	1911-20	1921-30	1931-40	1941-50	1951-60	1961-70
1	2	3	4	5	6	7
WEST INDIA						
Bombay	32,568,648	27,211,911	23,797,942	22,327,147	21,029,217	18,402,266
3-43 Bombay Deccan Northern	11,212,171	9,436,000	8,140,444	8,793,519	8,614,181	7,430,023
3-52 Bombay Deccan Southern	4,349,309	3,790,133	3,418,962	3,698,632	3,225,512	2,917,697
4-11 Bombay Gujrat	10,452,380	8,707,802	7,477,030	6,686,077	4,286,369	3,633,986
4-21 Greater Bombay	2,267,219	1,498,842	1,298,336	2,267,219	1,498,842	1,298,336
4-22 Bombay-Konkan . . .	4,287,069	3,779,114	3,463,170	3,881,700	3,404,313	3,122,224
4-12 Saurashtra	3,849,030	3,257,288	2,755,706			
4-13 Kutch	537,743	514,188	502,522			
CENTRAL INDIA						
Madhya Pradesh	20,439,573	18,711,755	16,794,089	17,423,092	16,053,050	14,519,032
3-24 North-West Madhya Pradesh	5,326,047	4,940,428	4,514,467	5,309,452	4,925,492	4,500,308
3-32 East Madhya Pradesh	9,742,552	8,730,158	7,664,779	6,743,566	6,086,389	5,403,882
3-41 South West Madhya Pradesh	5,370,974	5,041,169	4,614,843	5,370,974	5,041,169	4,614,843
Madhya Bharat	7,862,017	6,733,871	5,963,007			
2-35 Madhya Bharat Lowland	1,605,164	1,413,837	1,249,297			
3-13 Madhya Bharat Plateau	4,383,909	3,911,418	3,481,960			
3-14 Madhya Bharat Hills . .	1,572,944	1,408,616	1,231,750			
Hyderabad	17,491,114	15,377,645*	13,442,946*			
3-42 North Hyderabad . . .	5,665,302	5,102,742	4,458,566			
3-51 South Hyderabad . . .	11,825,812	10,279,023	8,986,728			
3-23 Vindhya Pradesh	3,470,670	3,167,101	2,842,950			
3-23 Bhopal	807,549	751,309	704,827			
NORTH-WEST INDIA						
Rajasthan	14,298,514	12,285,266	10,566,194			
2-34 East Rajasthan Plain	6,163,904	5,370,356	4,770,051			
2-41 Rajasthan Dry Area . .	4,269,241	3,537,658	2,855,790			
3-11 Rajasthan Hills	1,939,031	1,652,820	1,415,001			
3-12 Rajasthan Plateau . . .	1,926,338	1,724,432	1,525,352			
Punjab	12,669,904	11,735,879	10,279,187	12,627,715	11,736,733	10,281,057
1-13 Himalayan Punjab . . .	952,445	873,407	810,821	960,073	888,026	824,745
2-31 Punjab Plain	11,717,459	10,862,472	9,468,366	11,667,642	10,848,707	9,456,312
1-12 Himachal Pradesh and Bilaspur	1,083,589	1,005,994	922,161	1,116,218	1,055,665	994,997
2-31 Patials & East Punjab States Union	3,448,136	3,148,154	2,756,756			
2-33 Delhi	1,334,006	777,093	565,349	1,331,006	777,093	565,349
2-36 Ajmer	638,533	545,329	476,903	638,533	545,329	476,903

*An adjustment on account of the transfer of a number of villages has been made in Hyderabad State & Co., therefore, it does not tally with the division totals where no similar adjustments could be made.

ANNEXURE

Mean decennial growth rate during

State and District	Growth of Population during decade			Mean decennial growth Rate			Registered Births during decade		
	1941-50	1951-60	1961-70	1941-50	1951-60	1961-70	1941-50	1951-60	1961-70
1	8	9	10	11	12	13	14	15	16
INDIA	42,074,730	39,313,042	27,345,810	12.5 (12.4)	13.3 (13.0)	10.4 (9.6)	68,047,335	75,349,879	66,939,428
North India	6,653,594	6,731,904	3,105,013	11.2 (11.2)	12.7 (12.8)	6.5 (6.5)	14,479,317	17,667,306	15,921,016
East India	9,215,584	10,891,018	7,171,398	10.8 (10.8)	14.4 (14.3)	10.8 (10.4)	16,408,593	19,893,444	19,069,737
South India	10,563,154	7,150,621	5,951,730	15.3 (14.5)	11.7 (11.0)	10.9 (9.4)	17,791,194	17,807,862	14,775,787
West India	7,411,359	4,532,679	3,321,756	20.1 (20.8)	14.6 (14.5)	12.3 (12.1)	7,341,581	7,816,171	6,603,769
Central India	4,994,073	5,064,473	4,923,311	10.0 (7.2)	11.3 (9.3)	12.4 (10.9)	6,446,177	6,608,830	6,008,081
North-West India	3,005,833	4,938,102	2,870,225	9.0 (6.0)	16.7 (17.5)	11.2 (10.6)	5,580,473	5,556,266	4,561,038
Andhra Pradesh	—2,797	4,305	2,377	—8.6	13.6	8.4			
Uttar Pradesh	6,653,591	6,731,904	3,105,013	11.2	12.7	6.5	14,479,317	17,667,306	15,921,016
Assam	3,667,528	3,971,880	3,378,943	9.6	11.5	10.9	8,371,213	10,503,937	10,542,504
Bihar	1,412,576	1,556,477	1,118,007	8.4	9.8	7.7	3,799,344	4,981,745	4,855,322
Madhya Pradesh	1,325,576	1,339,947	979,839	12.6	14.6	12.2	2,512,912	3,067,919	3,027,774
Mizoram	410.0	1,075.436	1,231.547	8.7	11.4	15.6	2,058,957	2,454,273	2,659,408
Nagaland	4,770.5	1,276,932	1,332,470	6.2	9.7	11.3	2,186,246	2,604,118	2,456,134
Odisha	1,010.5	843.322	892,323	8.0	12.2	14.7	460,430	454,995	389,213
Punjab	2,674.7	435.010	440,267	4.1	7.0	7.7	1,725,763	2,149,123	2,066,921
Rajasthan	3,573,013	4,173,865	1,262,590	12.7	21.1	7.4	4,647,359	5,256,685	4,714,056
Sikkim	213.232	80,388	5.6	12.1	12.1	5.0	338,187	366,772	302,963
Tamil Nadu	5,171,545	3,574,658	1,184,041	13.1	22.0	7.7	4,309,172	4,889,913	4,411,093
Uttarakhand	1,440,690	1,248,531	1,027,866	17.4	17.9	17.6			
Vishakhapatnam	1,113,710	905,071	122,795	18.4	17.2	18.1	1,203,773	1,528,704	1,357,043
West Bengal	2,211,547	66,463	61,590	11.7	22.5	15.0			
Goa	12,012	130,560	78,013	12.0	13.9	14.9			
Karnataka	16,225	11,712	28,057	21.9	29.2	22.7			
Kerala				12.5	10.1	29.3			
Lakshadweep	7,174,533	5,181,266	4,056,951	13.4	11.0	9.5	16,430,283	16,401,025	13,613,507
Manipur	1,111.3	21,774	377,420	11.7	10.3	9.8	1,375,666	1,642,748	1,376,444
Meghalaya	1,111.3	21,774	377,420	18.6	10.9	12.6	2,951,278	1,879,531	1,710,808
Mizoram	1,111.3	21,774	377,420	12.5	11.0	11.4	4,143,616	4,189,108	3,339,662
Nagaland	1,111.3	21,774	377,420	13.1	11.1	7.9	6,759,723	8,639,638	7,186,593
Odisha	1,111.3	21,774	377,420	21.2	11.1	9.2	1,326,771	1,366,899	1,125,462
Punjab	1,111.3	21,774	377,420	21.2	17.3	23.3	1,699,711	1,357,609	958,264
Rajasthan	1,111.3	21,774	377,420	30.5	3.3	—0.3	34,140	39,938	36,818

1. The figures in parentheses in columns 11, 12 and 13 are the figures on the Statistical Error (Cols. 29, 30 and 31) and Z-scores refer to areas of categories A and B defined as follows: A = 10% and B = 20%.

three decades—General Population

State and Division	Growth of Population during decade			Mean decennial growth Rate			Registered Births during decade		
	1941-50	1931-40	1921-30	1941-50	1931-40	1921-30	1941-50	1931-40	1921-30
I	8	9	10	11	12	13	14	15	16
WEST INDIA									
Bombay	6,775,004	3,938,471	2,889,466	20.8	14.5	12.1	7,341,581	7,816,171	6,603,769
3 43	2,305,128	1,247,214	1,343,898	20.6	13.2	16.5	3,105,621	3,403,625	2,893,391
3 52	697,340	421,972	320,409	16.0	11.1	9.4	1,330,504	1,242,727	1,092,468
4 11	1,885,817	1,600,340	861,205	18.1	18.4	11.5	1,335,099	1,666,718	1,315,632
4 21	1,144,102	392,653	8,358	50.5	26.2	0.6	523,190	380,164	244,472
4 22	739,617	276,292	355,596	17.3	7.3	10.3	1,047,167	1,122,937	1,057,806
4 12	576,650	606,824	396,341	13.0	18.6	14.4			
4 13	59,726	12,616	35,949	11.1	2.5	7.2			
CENTRAL INDIA									
Madhya Pradesh	1,615,918	1,839,719	1,995,614	7.9	9.8	11.9	6,446,177	6,608,830	6,008,081
3 24	328,725	442,513	402,410	6.2	9.0	9.1	1,955,555	2,150,801	1,853,715
3 32	913,615	1,111,174	1,019,584	9.4	12.7	13.3	2,372,883	2,384,923	2,131,825
3 41	373,578	286,032	566,620	7.0	5.7	12.3	2,117,739	2,073,106	2,022,541
Madhya Bharat	784,274	872,019	669,709	10.4	12.9	11.2			
2 35	173,388	209,265	119,817	10.8	14.8	9.6			
3 13	463,503	481,481	377,433	10.6	12.3	10.8			
3 14	147,383	181,273	172,459	9.4	12.9	14.0			
Hyderabad	2,327,989	1,898,949*	1,970,449*	13.3	12.3	14.7			
3 42	562,204	562,916	705,437	9.9	11.0	15.8			
3 51	1,765,785	1,327,793	1,256,796	14.9	12.9	14.0			
3 22	208,041	399,097	249,205	6.0	12.6	8.8			
3 23	57,851	54,629	38,334	7.2	7.3	5.4			
NORTH-WEST INDIA									
Rajasthan	1,984,565	2,041,932	1,396,212	13.9	16.6	13.2			
2 34	842,926	744,170	456,441	13.7	13.9	9.6			
2 41	669,087	794,079	569,655	15.7	22.4	19.9			
3 11	308,729	263,693	211,946	15.9	16.0	15.0			
3 12	163,823	239,990	158,170	8.5	13.9	10.4			
Punjab	57,398	1,625,448	987,936	—0.5	16.4	9.6	4,997,531	5,052,481	4,183,065
1 13	59,495	98,581	26,590	6.2	11.3	3.3	327,433	318,658	286,384
2 31	116,893	1,826,867	961,346	—1.0	16.8	10.2	4,670,098	4,733,823	3,896,681
1 12	51,755	103,435	64,230	4.8	10.3	17.0	35,094	30,014	
2 32	91,099	508,865	213,931	2.6	16.2	7.7			
2 33	826,133	281,693	147,794	62.0	36.2	26.2	39,410	299,037	217,661
2 36	109,679	76,729	60,122	17.2	14.1	12.6	184,532	204,748	166,312

* The adjustment on account of the transfer of a number of villages has been made in Hyderabad State total, therefore, it does not tally with the division totals where no similar adjustments could be made.

ANNEXURE

Mean decennial growth rate during

State and Division	Mean decennial birth rate (Registered)			Registered deaths during decade			Mean decennial death rate (Registered)		
	1941-50	1931-40	1921-30	1941-50	1931-40	1921-30	1941-50	1931-40	1921-30
1	17	18	19	20	21	22	23	24	25
INDIA	27.2	33.8	33.7	48,597,377	51,206,579	50,245,842	19.4	23.0	25.3
North India	24.8	34.2	34.0	9,664,105	11,333,226	11,993,248	16.5	21.9	25.6
East India	21.7	29.8	32.5	13,260,931	14,458,803	14,859,900	17.5	21.7	25.3
South India	28.8	32.8	30.1	11,994,657	11,586,869	10,443,465	19.4	21.3	21.3
West India	32.9	37.2	35.9	5,038,376	5,275,109	4,912,309	22.6	25.1	26.7
Central India	37.0	41.2	41.4	5,287,720	5,115,188	4,611,449	30.3	31.9	31.8
North-West India	38.2	42.5	40.3	3,151,588	3,437,384	3,425,871	23.0	26.3	30.3
Andaman and Nicobar Islands	..	..	..	..	..	..	..	..	..
NORTH INDIA									
Uttar Pradesh	24.8	34.2	34.0	9,664,105	11,333,226	11,993,248	16.5	21.9	25.6
1-11	29.3	36.5	34.7	381,278	426,498	430,996	19.3	24.6	27.5
2-14	21.8	30.4	30.0	2,526,415	2,846,158	3,005,366	15.3	19.3	22.3
2-21	20.2	30.0	30.8	2,103,872	2,634,496	2,891,645	13.8	19.6	23.7
2-22	29.5	39.3	38.9	3,929,398	4,652,027	4,845,841	18.7	25.1	28.9
3-21	27.6	38.3	36.2	723,142	774,047	819,400	19.1	23.9	28.1
EAST INDIA									
Bihar	21.9	30.6	34.3	6,139,423	7,362,275	7,499,151	16.1	21.4	24.4
2-12	21.8	31.3	33.3	3,087,306	3,506,041	3,603,771	17.7	22.0	24.7
2-13	23.9	31.4	37.7	1,821,313	2,121,114	2,246,115	17.3	23.1	28.0
3-31	20.2	26.6	33.0	1,230,804	1,735,120	1,649,265	12.1	18.8	20.4
Orissa	28.2	35.7	37.3	2,017,370	2,069,927	2,030,427	26.0	28.4	30.8
3-33	24.7	27.1	29.2	376,467	331,527	267,262	20.2	19.8	20.1
5-11	29.3	38.3	39.4	1,640,903	1,738,400	1,763,165	27.9	31.0	33.6
West Bengal	20.5	27.5	28.7	4,292,221	3,996,988	4,287,236	18.9	20.9	26.1
1-25	26.2	32.2	29.8	313,637	299,169	279,330	24.3	26.2	27.4
2-11	20.2	27.2	28.6	3,978,584	3,697,819	4,007,906	18.6	20.6	26.0
Assam	16.8	25.6	27.1	811,917	1,029,613	1,042,686	11.4	17.2	20.8
1-21	..	..	..	..	..	..	..	..	..
1-22	..	..	..	..	..	..	..	..	..
1-23	..	..	..	..	..	..	..	..	..
1-24	..	..	..	..	..	..	..	..	..
1-26	..	..	..	..	..	..	..	..	..
SOUTH INDIA									
Madras	30.8	34.7	31.9	11,015,377	10,512,272	9,431,588	20.6	22.3	22.1
3-54	33.1	38.5	35.7	1,082,344	1,111,996	990,797	22.7	26.1	25.7
4-23	31.3	35.0	35.8	1,141,176	1,105,590	1,060,249	18.3	20.6	22.2
5-12	30.5	34.7	30.9	2,809,859	2,703,746	2,293,336	20.7	22.4	21.3
5-21	30.4	34.0	31.0	5,981,988	5,590,940	5,085,206	20.7	21.9	21.9
3-53	16.2	19.7	17.9	955,763	1,035,819	961,100	11.6	14.9	15.3
4-24	20.3	19.7	17.0	785,973	752,906	544,851	9.4	10.9	9.7
4-25	17.2	24.1	22.5	28,517	38,778	50,777	14.3	23.4	31.0

three decades—General Population

State and Division	Mean decennial birth rate (Registered)			Registered deaths during decade			Mean decennial death rate (Registered)		
	1941-50	1931-40	1921-30	1941-50	1931-40	1921-30	1941-50	1931-40	1921-30
I	17	18	19	20	21	22	23	24	25
WEST INDIA									
Bombay	32.9	37.2	35.9	5,038,376	5,275,109	4,912,309	22.6	25.1	26.7
3.43	35.3	39.5	38.9	2,144,667	2,243,327	2,055,726	24.4	26.0	27.7
3.52	36.0	38.5	37.4	905,457	849,408	794,588	24.5	26.3	27.2
4.11	36.2	38.9	36.2	912,657	1,141,646	969,407	24.8	26.6	26.7
4.21	23.1	25.4	18.8	363,410	316,242	365,409	16.0	21.1	28.1
4.22	27.0	33.0	33.9	712,185	724,486	727,179	18.3	21.3	23.3
4.12									
4.13									
CENTRAL INDIA									
Madhya Pradesh	37.0	41.2	41.4	5,287,720	5,115,188	4,611,449	30.3	31.9	31.8
3.24	36.8	43.7	41.2	1,670,193	1,725,575	1,462,604	31.5	35.0	32.5
3.32	35.2	39.2	39.4	1,893,441	1,693,713	1,612,927	28.1	27.8	29.8
3.41	39.4	41.1	43.8	1,724,086	1,695,898	1,535,918	32.1	33.6	33.3
Madhya Bharat					..	.	.	..	..
2.35									
3.13									
3.14	.	.		.					
Hyderabad	.		.	..		..	..	..
3.42						..	..	..
3.51				.	.	..			..
3.22				.	.			..	.
3.23				.		.	.	..	..
NORTH-WEST INDIA									
Rajasthan	.			.	..	..	..	..	.
2.34					..	..	.	.
2.41	..				.	..	.	.	..
3.11	.					..			.
3.12	..					..	.	.	.
Punjab	39.5	43.0	40.6	3,025,595	3,097,916	3,129,378	23.9	26.3	30.4
1.13	34.1	35.8	34.7	228,579	239,615	259,109	23.8	26.9	31.4
2.11	40.0	43.6	41.2	2,797,016	2,858,301	2,870,269	23.9	26.3	30.3
1.12	30.4	28.4		23,073	23,674	..	19.5	22.4	..
2.32	.					.	.	.	..
2.33	29.9	38.5	38.7	188,560	174,577	164,529	14.1	22.5	29.2
2.36	28.9	37.5	33.6	137,433	164,891	131,864	21.5	30.2	27.7

ANNEXURE

Mean decennial growth rate during

State and Division	Decennial rate of Natural increase (Registered)			Migration-Cum-Statistical error		
	1941-50	1931-40	1921-30	1941-50	1931-40	1921-30
I	26	27	28	29	30	31
INDIA	7.8	10.8	8.4	4.7 (4.6)	2.5 (2.2)	2.0 (1.2)
North India	8.3	12.3	8.4	2.9 (2.9)	0.4 (0.5)	-1.9 (-1.9)
East India	4.2	8.1	7.2	6.6 (6.6)	3.3 (6.2)	3.6 (3.2)
South India	9.4	11.5	8.8	5.9 (5.1)	0.2 (-0.5)	2.1 (0.6)
West India	10.3	12.1	9.2	9.8 (10.5)	2.5 (2.4)	3.1 (2.9)
Central India	6.7	9.3	9.6	3.3 (0.5)	2.0 (0.0)	2.8 (1.3)
North-West India	15.2	16.2	10.0	-6.2 (-9.2)	0.5 (1.3)	1.2 (0.6)
Andaman and Nicobar Islands						
NORTH INDIA						
Uttar Pradesh	8.3	12.3	8.4	2.9	0.4	-1.9
111	10.0	11.9	7.2	7.6	0.9	0.8
214	6.5	11.1	7.7	4.5	0.2	-0.7
221	6.4	10.4	7.1	5.6	2.8	-2.1
222	10.8	14.2	10.0	0.6	-0.8	-3.4
321	8.4	14.4	8.1	-1.3	-1.4	0.3
EAST INDIA						
Bihar	5.8	9.2	9.9	3.8	2.3	1.0
212	4.1	9.3	8.6	4.3	0.5	-0.9
213	6.6	10.3	9.7	6.0	4.3	2.5
314	8.1	7.8	12.6	0.6	3.6	3.0
Orissa	2.2	7.3	6.5	4.0	2.4	4.8
231	4.5	7.3	9.1	3.5	4.9	5.6
211	1.4	7.3	5.8	2.7	-0.3	1.9
WEST BENGAL						
111	1.6	6.6	2.6	11.1	14.5	4.8
211	1.9	6.0	2.4	6.7	6.1	2.6
212	1.6	6.6	2.6	11.5	15.4	5.1
231						
232	5.4	8.4	6.3	13.0	8.8	11.8
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three decades—General Population

State and Division	Decennial rate of Natural increase (Registered)			Migration-Cum-Statistical error		
	1941-50	1931-40	1921-30	1941-50	1931-40	1921-30
I	26	27	28	29	30	31
WEST INDIA						
Bombay	10.3	12.1	9.2	10.5	2.4	2.9
3.45	10.9	13.5	11.2	9.7	-0.3	5.3
3.52	11.5	12.2	10.2	4.5	-1.1	-0.8
4.11	11.4	12.3	9.5	6.7	6.1	2.0
4.21	7.1	4.3	-9.3	43.4	21.9	9.9
4.22	8.7	11.7	10.6	8.6	-4.4	-0.3
4.12	.	.	.	.	.	.
4.13	.	.	.	.	.	.
CENTRAL INDIA						
Madhya Pradesh	6.7	9.3	9.6	0.5*	0.0*	1.3*
3.24	5.3	8.7	8.7	0.8*	0.3*	0.3*
3.32	7.1	11.4	9.6	1.1*	1.1*	1.6*
3.41	7.3	7.5	10.5	-0.3	-1.8	1.8
Madhya Bharat	.	.	.	.	.	.
2.35	.	.	.	.	.	.
3.13	.	.	.	.	.	.
3.14	.	.	.	.	.	.
Hyderabad	.	.	.	.	.	.
3.42	.	.	.	.	.	.
3.51	.	.	.	.	.	.
3.22	.	.	.	.	.	.
3.23	.	.	.	.	.	.
NORTH-WEST INDIA						
Rajasthan	.	.	.	.	.	.
2.34	.	.	.	.	.	.
2.41	.	.	.	.	.	.
3.11	.	.	.	.	.	.
3.12	.	.	.	.	.	.
Punjab	15.6	16.7	10.2	-16.1	-0.3	-0.6
1.13	10.3	8.9	3.3	-4.1	2.4	0.0
2.31	16.1	17.3	10.9	-17.1	-0.5	-0.7
1.12	10.9	6.0	...	-6.1	4.3	...
2.32	...	.	...	...	.	.
2.33	15.8	16.0	9.5	46.2	20.2	16.7
2.16	7.4	7.3	5.9	9.8	6.8	6.7

*The figures have been worked out by substituting the mean decennial growth rate of the population of the area under registration instead of figures relating to total area given in Cols. 11-13

ANNEXURE II

PART I

Computed Birth and Death Rates in India during 1941-50

by *Shri S. P. Jain, M.Sc, F.I.A., F.S.S., Census Actuary*

In this note an attempt has been made to estimate from the Census data the levels of birth and death rates in the various States obtained during the last intercensal period 1941-50. Birth and death rates are linked with each other through the rates of growth and migration, of which the former is reliably given by the last Census. There is usually some uncertainty about the migration data but this time it is particularly worse because of the relevant data for 1941 not having been tabulated, large scale migration following Partition and division and integration of States that took place during the decade. Migration factor has generally been ignored in Indian demographic studies of this kind, as its effect is considered to be trivial. However, from the discussions that follow it would appear that for a proper study this element is not so negligible. Its effect on the finally computed birth and death rates may be by quite a few points, which make all the difference in regard to the estimates conforming to certain other information in the matter. In this note, migration factor as affecting population growth has been tackled even though with imperfect data. The estimates have been made by two independent methods. By the first method, which may be called the 'difference-making' method, a direct estimate of death rate has been obtained, and the corresponding birth rate deduced therefrom. In such deductions, the problem has been to split up on the available data the observed growth rate into rate of natural increase based on excess of births over deaths and rate of migration gain or loss. Mr. Hardy in his Actuarial Report for 1901 seems to have made the first attempt to estimate the levels of birth and death rates in important States by this method, ignoring the migration element. A similar calculation has been made by Mr. Porter in respect of Bengal in 1931 Census Report for the

province. By the second method, which has come to be known as the 'Reverse Survival' method, a direct estimate of birth rate has been made. Considering the very good agreement between the estimate of birth rate by this method and that deduced by the first method, it is not necessary to deduce the corresponding death rate. It may be stated that the final estimates of birth and death rates obtained in this study are given in columns 6 and 7 of Table I. Estimates of birth rates in 1950 based on the infants enumerated in 1951 Census are discussed in Part II of the note. In para (7), the evidence for the extent of omission in birth and death registration is presented and in para (8) the trend in birth and death rates for the last fifty years is reviewed. Kingsley Davis has given in his book 'The Population of India and Pakistan' valuable material on these topics and it has been considered in this note in the light of the results obtained here.

(2) Census data can be used to estimate levels of birth and death rates in the various parts of the country. In essentials, the problem is to break up an observed intercensal increase in the population into its various components, for confining attention to the intercensal period, we have

Population increase

$$\begin{aligned} &= \text{Births (B)} - \text{Deaths (D)} \\ &+ \text{Fresh Immigration (FI)} \\ &- \text{Fresh Emigration (FE)} \quad \dots\dots (A) \end{aligned}$$

Here, population increase is the difference between the enumerated population at the two Censuses. Our knowledge of fresh immigration and emigration in India is derived from birth place statistics collected during the Censuses. In the Census children of immigrants or emigrants born

at the place of migration are recorded as the native population of the place. Thus, it is implied in the above relationship that births among immigrants are to be included in B and not in FI. This conforms to the registration practice of recording births by place of occurrence, under which births among immigrants will go to increase the number of registered births in the place. Similarly, deaths are reckoned by place of occurrence and hence deaths among immigrants are included in D. Thus, FI represents fresh immigration without including subsequent births and deaths in the migrating group. The same is true of FE. Births and deaths among them do not enter in the above relationship directly. Of course, in the calculation of FI or FE by the method of tracing change in birth place statistics recorded at two points of time, allowance will have to be made for changes due to deaths in the migrant group, but this is another matter. The terms on both the sides of the above relationship may be divided by the mean population during the intercensal period. The mean population may be estimated in a simple manner by taking the average of the enumerated populations at the two Censuses. We get the following relationship in terms of rates —

Mean Decennial Population Growth Rate

wise, throughout these calculations 1951 population has been taken exclusive of displaced persons. This procedure resolves to a large extent the complications arising out of an unusual migratory movement but the problems due to emigrating Muslims are still left. Thus Muslim emigration is taken in the calculations along with normal emigration. It may be noticed that the Mean Decennial Growth Rate referred to in para 2 is different from that shown in Census of India Paper No. 1—1952 in that the former excludes displaced persons.

(3) *Death Rate* — As would be clear from the above discussion, deaths as required here should include (a) deaths in 1941 population (b) deaths among the births during the intercensal period and (c) deaths among fresh immigrants. But for the disturbing factor of migration, deaths under head (a) can be simply obtained. The survivors of 1941 population are enumerated as population aged 10 and over and, therefore, the difference between 1941 total population and 1951 population aged 10 and over gives the deaths under (a). The effect of migration is that survivors of fresh immigration during the intercensal period reduce the difference and that survivors of fresh emigration increase it. Hence, to allow for migration, it is necessary to estimate in 1951 the numbers of surviving fresh immigrants and emigrants. This would involve making some assumption about the manner in which the streams of immigrants and emigrants moved and the mortality rates to be applied to them. There is very little data which can be helpful in fixing these assumptions. In order to avoid making such assumptions without any factual knowledge, it seems better to calculate death rate with reference to the natural population and to make the plausible assumption that the death rate in the natural population is the same as in the resident population. Usually in India migration is not of such a magnitude that the sex-age composition of the resident population is materially different from that of the natural population, by and large the bulk of the resident population consists of the natural population. It is, therefore, unlikely that the death rates in the two populations would differ appreciably. In the calculations death rate among the natural population was taken in equation B of para 2. The main merit of this approach is that natural population is depleted by mortality only. If the Census data are correct, an estimate of death rate unaffected by any other extraneous factor is

directly obtained. Thus, we have now to estimate deaths in the natural population under heads (a) and (b) only.

(3.21) Natural population at the Census time is easily obtained by adding emigrants to and subtracting immigrants from the enumerated population. The difference between 1941 total population and 1951 population in the age sector 10 and over gives deaths under head (a). This difference is nearly equal to deaths at ages 5 and over in the natural population which is changing in composition due to births and deaths only. The difference, referred to, here, includes deaths below age 5 in 1941 population. Such deaths took place within the next 5 years of 1941, as persons below age 5 after this period were survivors of births after 1941, and not of 1941 population. Further, the difference excludes deaths above age 5 among the births of the intercensal period. Such deaths were obviously at ages 5-10 and from amongst survivors of births during the next five years after 1941 but had nothing to do with 1941 population. Subject to an adjustment for these inclusion and exclusion the difference is *exactly* equal to deaths at ages 5 and over. Mortality in the first five years of life is much heavier than in the following five years, and, therefore, the inclusion is more than the exclusion except in a possible though unusual case when the births during the next five years after 1941 may be abnormally high. Thus, generally speaking, the difference should be slightly in excess of the deaths at ages 5 and over in the natural population. It is possible to make an estimate of this excess as explained in paragraph (3.24). Calculations in an actual case showed that the excess is well within 5%. For practical purposes the excess may be ignored, as the labour involved in making the necessary calculations for adjusting for the excess is not worth the result. The refinement loses its importance in the face of a much broader assumption that has to be made for estimating total deaths in the community. Actual registration data of deaths by ages gives the ratio of deaths above age 5 to the total deaths recorded. This ratio may be applied to the difference to arrive at the total deaths in the natural population. Vital statistics are defective but the ratio based on them may be good enough for practical purposes. Strictly speaking, percentage omission in the registration of deaths below age 5 is likely to be

relatively more than that for deaths in the remaining span of life and for this reason, the ratio as obtained from the registration data is likely to be an under-estimate. This factor may go to minimise the effects of ignoring the excess referred to earlier in this para. Thus, the total deaths under heads (a) and (b) calculated as above when divided by the mean natural population give mean death rate during the period 1941-50.

(3.220) Certain points of detail with regard to emigrants and immigrants enumerated at the Censuses may now be taken up. Firstly, the proportion of persons below age 10 in the migrant population is likely to be small enough and it would not appear to be incorrect to treat practically all the migrant population as above age 10, since as already stated births among them are not included in the migrant group.

(3.221) Allowance has to be made for Muslim migrants from India to Pakistan after partition. Their number is not yet available from the Indian and Pakistan Census data. Perhaps it may be possible to get some firm figures from the Pakistan Census at a later date. For the present their number has been estimated by the Census Superintendents. Here we are concerned with their survivors at the time of 1951 Census. Since the number of Muslim emigrants itself is a broad estimate, refinements are out of place, and hence the survivors are taken at 90% of the estimated figure of Muslim emigrants. It may be worth mentioning here that Muslim emigration was very heavy in Punjab and PEPSU only. In fact, in these States, the pre-partition composition of the population has been thoroughly changed. Delhi also had a considerably high number of Muslim emigrants. Other areas from which emigration of Muslims was of some considerable magnitude are U. P., Bihar, West Bengal, Assam, Rajasthan and Ajmer. Certain States like Madras, Travancore-Cochin, Mysore, Vindhya Pradesh and Orissa were practically unaffected by this movement.

(3.222) Another point is the estimation of migrant population as at 1941 Census. Here the relevant censal figures relating to migrants are available for 1931, and next for 1951. The figures for 1941, have, therefore, to be estimated from those for 1931 and 1951. The abnormal migration following partition has already been considered and hence can be ignored in this

context. Certain developments which are peculiar to the period complicate a reliable estimation of migrant population in 1941. Since 1931 the boundaries of States have changed. The first instalment of major changes in the boundaries took place round the year 1936. Sind was separated from Bombay, Bihar and Orissa were formed into distinct provinces which involved carving out certain areas from C. P., Bihar, Orissa and Madras. The next major alteration in the boundaries of States was effected during the period 1947 to 1950. Punjab, Bengal and Assam were partitioned, and integration of States in other areas took place. Practically every State has thus been affected if not by a major operation, at least by the comparatively minor event of mergers. It is unnecessary to go into the details here, but it would suffice to say that a consideration of the magnitude of these changes would bring home the difficulties of estimating 1941, or as a matter of that, even 1931 migrant population corresponding to 1951 layout of States. Somehow 1931 migrant population for 1951 layout of States was pieced together from the data given in 1931 Census Reports, but there is a big snag in this procedure, which can be well illustrated by the example of Bengal. In 1931 Census persons born in East Bengal and enumerated in West Bengal and *vice versa* were treated as non-migrants but in 1951 Census they appear as migrants. There are no available data for correcting the figures for this change. Similar remarks apply to other areas partitioned since 1931 such as Bihar and Orissa, Bombay and Sind and so on. Apart from this there is the further problem of estimating the migrant population of the two partitioned portions. In 1921 Census Reports immigration and emigration figures are available in their breakdown by districts but not so in 1931 Reports, as this healthy practice was discontinued. In the circumstances, the migration figures for the combined State were split up in the ratio of the corresponding migrant population of the two areas as shown in 1921 Report. Thus, estimates of the migrant populations in 1931 for the two partitioned areas were obtained. There is yet another minor development which, to some extent, has affected the comparability of 1951 and 1931 migration data. In 1931 Census counting was one night affair on a *de facto* basis but in 1951 the Census counting was spread over 20 days. In 1931 Census a person who may have gone over to another place for a few days was enumerated wherever he was found to be on the Census night

and thus treated as a migrant, whereas in 1951 he was more likely to be relegated to his normal place of residence, which in majority of cases would be his birth place also, and thus counted as a non-migrant. However, it seems improbable that this factor has much weight in affecting the final figures of migration, as losses and gains may more or less balance out.

(3-223) Having obtained 1931 migration figures for 1951 layout, the next hurdle is to fix the figures for 1941. There is hardly any objective data for allocating between the two decades the increase or decrease in the migrant population of a State during 1931-50. In 1941 for a few States, *viz.* Bombay, Bihar, Orissa and Madhya Pradesh only figures of enumerated persons born outside the State were tabulated on about 1% sample basis, but the figures of immigration thus brought out for the State as a whole do not appear to be satisfactory. This is glaringly shown by the data for Madhya Pradesh, where they show practically no immigration. This information for Madhya Pradesh was ignored. This tabulation in the case of Ajmer, Delhi, Mysore, Travancore-Cochin and Hyderabad only was made for the complete count. Immigration figure for 1941 where thus available was adopted, even though it is not considered to be satisfactory, and without its emigration counterpart is not of much help. Thus, the allocation referred to above where it became necessary was made on the advice of the State Census Superintendents, who carefully considered the possibilities of any special openings for immigration to and emigration from the State having occurred during 1931-50 to justify a departure from fifty-fifty allocation based on a steady flow of migration. On such advice 60% of the change in emigrant population shown by 1951 and 1931 Census figures for Bombay State is taken to have occurred during 1941-50. In the case of Madras the ratio of allocation is 57.5%, for Assam it is 59%, for Saurashtra it is 60%, for Punjab it is 60% in the case of immigration and 50% in the case of emigration. In other cases, 1941 figures were taken to be mean of those for 1931 and 1951. In the case of Madras there is yet another difficulty due to the fact that a very large proportion of her emigrants have gone over to outside countries like Ceylon, Singapore, Malaya, Thailand, Indonesia, Burma, etc. The number of such emigrants, being not known, has been estimated at 1,692,800 in 1951 on certain

rough and ready bases as against a figure of 1,032,000 in 1931. This estimate for 1951 is high enough to affect the resulting estimate of fresh migration during 1941-50 which is commented upon in paragraph (410).

(3 224) The above remarks on migration show how unsatisfactory the bases of estimating migration change during 1941-50 are. However, an attempt has been made as explained above to assess the correct position in a bad situation of paucity of data. In States where migration change is not material, the estimates have served well but where the change is substantial, certain contradictory results are obtained in some cases, which are discussed later in this note. This discussion here points to the need for a greater attention to the migration statistics in Indian Censuses. Any uncertainty about the migration factor leaves one guessing about the role of the other factors in the population prognosis. The comparatively small migration in the Indian population seems to be no justification for ignoring this very important factor, since it is essential to have some firm idea about its role in causing population changes. It is suggested that a proper plan for the routine collection of data in respect of immigration from and emigration to India may be evolved. Now that India has attained an independent status and it is necessary to take stock of the distribution of her people all over the world for various practical reasons also. Further, a comprehensive scheme may be worked out for the type of internal migration data which should be collected and tabulated at the Censuses.

(3 225) To summarise, the method for calculating death rate adopted here is as follows. The population aged 10 and over of a State as at 1951 Census is calculated by multiplying its total population (P_2) by the ratio (f) of 10% sample population aged 10 and over to the total sample population, which already excludes displaced persons. This is subtracted from the population (P_1) of the State as at 1941 Census. To this difference is added the algebraic excess of 1951 immigrants (I_2) over 1941 immigrants (I_1) and the algebraic excess of 1951 emigrants (E_2) over 1941 emigrants (E_1) is subtracted from the result. E_2 includes the survivors of Muslim emigrants on partition, reckoned at 90% of the estimated number of Muslims who went out. The result is taken to give the number of deaths

at ages 5 and over in the natural population of the State during 1941-50.

In symbols :

$$\text{Natural population at 1941 Census} = N_1 \\ = P_1 + E_1 - I_1$$

$$\text{Natural population at 1951 Census} = N_2 \\ = P_2 + E_2 - I_2$$

$$\text{Deaths at ages 5 and over} = d$$

$$= P_1 - fP_2 + (E_1 - I_1) - (E_2 - I_2)$$

$$= P_1 - fP_2 + (I_2 - I_1) - (E_2 - E_1)$$

It will be observed that $(I_2 - I_1) - (E_2 - E_1)$ stands for the change by 1951 Census time in the 1941 Census migrant population. This may in brief be referred to as "migration change" as distinct from fresh migration.

A small point of detail in the calculation of (f) arises from the fact that population aged 10 at the census is inflated by the preference for returning this age, while those enumerated at ages 9 and 11 are deflated. There is a similar preference for returning age as 8 and 12. A rough and ready assumption may be made that the enumerated population at age 10 is high largely because of the deflation at ages 9 and 11 arising out of some of them having returned their ages as 10. If so, the true population aged 10 may be taken roughly as $1/3$ of the population enumerated as aged 9 to 11. Half of the excess of the population enumerated as aged 10 over this one third may be taken as aged below 10. Thus, the ratio (f) may actually be obtained as the ratio of the sample population aged 10 and over less half the excess referred to here to the total sample population.

Total deaths in the natural population during 1941-50 are estimated by multiplying d by the ratio of the total deaths in the State to the deaths at ages 5 and over as given by the vital registration data for 1941-50. Dividing total deaths thus obtained by the mean natural population of the decade, i.e., $(N_1 + N_2)/2$ yields the mean death rate in the decade. For States for which data on registered deaths by ages are not available, the ratio for a State in the same Zone for which these data are available is used. This ratio from the registration record of Bihar, Orissa

Assam and West Bengal ranges between 1.40386 and 1.50468, whereas the figure based on the registration records of the other Part A States varies between 1.62530 and 1.84835. The low values in the former cases are considered to be due to the greater omission of deaths below age 5, as the final calculations show a comparatively much higher omission in registration of births and deaths in those States. Accordingly, in the cases of Bihar, Orissa, Assam and West Bengal, a ratio of 1.63654 based on the combined data relating to the remaining Part A States was adopted. The final effect of this adjustment may be seen from the fact that on the basis of the original ratio the death rates for Bihar, Orissa, Assam including Manipur and West Bengal in order worked out to 22.3, 26.7, 27.5 and 24.5 per mille as against 26.0, 29.0, 30.8 and 28.2 per mille respectively. In the calculation smaller States have been combined with the major units such as Manipur with Assam, Kutch with Saurashtra, Vindhya Pradesh and Bhopal with Madhya Bharat, Bilaspur and Himachal Pradesh with PEPSU.

(3.24) Before passing on to the next item the theoretical adjustment which should be made in taking the difference between 1941 population and 1951 population aged 10 and over as equal to deaths at ages 5 and over in the community as mentioned in para (3.21) may be considered. Let M_x be the population between ages x and $x+1$ at 1941 Census and N_x be the population between ages x and $x+1$ at 1951 Census. From a life table applicable to the population, out of 1, born the number l_x surviving to age x and the number l_x enumerated between ages x and $x+1$, can be obtained for estimating the relevant number of deaths. Of M_x persons, x being less than 5, the number surviving to age 5 is $l_x \times \frac{M_x}{L_x}$. Thus the inclusion referred to in (3.21), viz. the number of deaths below age 5 in 1941 population is given by

$$\sum_{x=0}^4 M_x - l_x \times \sum_{x=0}^4 \frac{M_x}{L_x}$$

$S = l_x \times N_x$ Persons, x being greater than 5, are the survivors of $l_x \times \frac{N_x}{L_x}$ persons who were aged 5. Thus, the exclusion referred to in (3.21) viz. the number of deaths between ages 5-10 and the inter-censal births whose sur-

vivors are enumerated between ages 5-10 at 1951 Census is given by

$$\frac{9}{5} \sum N_x / L_x - \sum N_x$$

The difference of these two expressions gives an estimate of the excess which, as has been mentioned, is not considerable

(3.3) *Fresh Migration Rate.*— Migration change during 1941-50 having already been estimated as explained above, it is only necessary to make an allowance for deaths among the migrant population during the period in order to arrive at an estimate of fresh migration in the intercensal period. In respect of Muslim migrants, the number initially emigrated is known and hence 10% of the number gives the number of deaths among them, as the survivors to 1951 Census date have been taken at 90% in the earlier calculations. In respect of normal migration, it would appear to be a reasonable assumption in the absence of any information to the contrary that the migrant population grew steadily from 1941 to 1951. Thus, the changing migrant population can be replaced by the mean migrant population at the mid-censal point. An overall death rate may be applied to this mean population to estimate deaths in this migrant population in the next 5 years. In the calculations the death rate was uniformly taken at 20 per thousand per annum except in the cases of States in the Central India Zone, where it was taken at 25 per thousand per annum. A convenient expression for calculating fresh immigration from migration change (M.C.) (ignoring Muslim Emigrants) and 1951 immigration (I_2) and emigration (E_2) figures, allowing for deaths at 20% during the decade, would be as follows: $(M.C.) \div 20 \times (I_2 - E_2) - 20 \times \frac{1}{2} (M.C.) = 2(I_2 - E_2) + 9(M.C.)$ Fresh migration divided by the mean of 1941 population and 1951 population (excluding displaced persons) gives the fresh migration rate. The rate is taken as positive if there be a net immigration gain and negative if a net emigration loss.

(3.4) Death rate having been obtained directly, the corresponding birth rate is deduced with the help of relation (B) given in para 2. Thus, in symbols, we have:

$$B.R. = G.R. + D.R. - F.M.R.$$

The results of the calculations are shown in the TABLE I Columns (6) and (7) show birth rates and death rates obtained by the method explained above. The rates which have

obtained on some other considerations are marked with asterisk

TABLE I

It will be observed that for Madras, Travancore-Cochin, Bombay, Saurashtra and Punjab two sets of figures are given. The set of figures given in brackets are those obtained on the basis of the standard method explained above and the data furnished by the Census Superintendents. The other set of figures is obtained in a slightly different manner indicated in the next paragraph and is considered to be more appropriate. These rates have been taken into account in calculating the All-India birth rate and death rate

(4) Discussion of the results.— It will be observed that computed death rates for Madras, Bombay and Punjab *viz.*, 19.1, 21.3 and 18.2, respectively are lower than the registered death rates which are 20.6, 22.6 and 23.9 respectively

(4.10) In the case of Madras the registered deaths at ages 5 and over during 1941-50 are 6,687,300, whereas the difference between 1941 population and 1951 population aged 10 and over enumerated in Madras is 6,482,638. The value of the difference seems to be comparatively low, when it is considered that theoretically it should be higher still in view of the net emigration brought out by the available figures and the fact that the registered deaths do not cover the entire State. During 1941-50 there was no registration of births and deaths in certain small areas, *viz.*, Visakhapatnam and Srikakulam Agencies and the newly merged areas of Banganapalle, Sandur and Pudukkottai except for the period after 1949 when the births and deaths in the three merged States are included in the registration data. A low value of the difference may possibly arise due to (a) a comparatively more complete enumeration in 1951 Census and or, (b) a substantial fresh net immigration in place of net fresh emigration as brought out by the estimate of migration figures, which at the best is the result of an intelligent guess. As regards (a), while it is difficult to say how far this factor has been operative, it may be stated that a difference of 1% increase in efficiency of enumeration would make a difference of 2 lakhs nearly. This would, no doubt, raise the value of the difference but there would still be something left over to be explained on the basis of (b) as would be seen from the discussion below. As shown in (3.223) the number of emigrants from Madras outside the country in 1951 is estimated to be

higher than that in 1931. This does not seem to fit properly with the well-known fact that these foreign countries imposed severe restrictions on immigration and that a good proportion of emigrants to foreign countries had to return to Madras during 1941-50. A net immigration change seems more likely. Another factor which can account for the low value of the computed death rate is the ratio of total deaths to deaths at ages 5 and over according to registration records. For Madras, the ratio is 1.63553, whereas the highest value shown by any State is 1.84835. As is obvious the computed death rate varies directly with the value of the ratio. For instance, if the value of the ratio be 1.84835, the computed death rate would come out to be 21.6. It is difficult to make any objective assessment of the relative role of the various factors which could be responsible for a reduced value of the computed death rate. It is not unlikely that each one may be operating to some extent. In the present case, the evidence for the low value of the computed death rate being to a greater extent due to a miscalculation in migration is fairly strong and for the sake of presentation, the migration changes necessary to bring out different values of death rate have been worked out on the basis that only migration data are at fault. These figures are helpful in deciding the figure of death rate to be adopted. It is highly unlikely that the true death rate can be less than the registered rate of 20.7 per mille. For this rate, migration change should be a net immigration of 200,636 and the corresponding birth rate would then be 34.7 per mille. There is little doubt that there are some omissions in the registration of deaths. For 10% extra deaths on account of omission in registration, the true death rate would be 22.8 and true birth rate 35.0, if a net immigration change of 871,924 can be assumed. For 20% extra deaths, the true death rate would be 24.8 and true birth rate 36.5, if a net immigration change of 1,524,086 can be assumed. The size of immigration change required to support a large percentage of omission in deaths appears to be too high in the known circumstances. It seems that an assumption of 10% extra deaths, which agrees with the general belief in the matter is fairly reasonable. The corresponding birth and death rates have, therefore, been adopted for the State. A circumstantial evidence of the reasonableness of the assumption is given by the fact that the mean growth rates of the State during the last three intercensal periods are 9.5%

TABLE I—Computed Birth

<i>Mean Pop excluding D P (in 000's)</i>	<i>Migration change</i>	<i>F M R</i>	<i>G R</i>
2	3	4	5
59,634	-394781	-1 01	10 4
38,340	-910473	-2 95	9 5
14,197 1/2	-331439	-1 30	6 0
22,800	-862719	-2 86	3 9
8,725	-272834	-0 68	14 2
53,419	871924 (-312702)	0 55 (-1 45)	13 4 (13 4)
8,203	190101	3 16	21 1
8,390	172981 (-40294)	1 8 (-0 47)	21 2 (21 2)
199	9869	10 41	30 5
32,400	1005521 (408051)	3 77 2 10	19 9 (19 9)
4,351	-82987 -244606	-4 3 (-7 45)	13 0 (13 0)
20,383	-71695	-0 17	7 4
11,792	-54856	-0 39	8 1
17,489	-20546	-0 29	13 3
14,150	-332050	-3 37	11 9
11,482	-3608662 (-4165799)	-36 1 (-39 58)	-21 2 (-21 2)
4,351	-610981	-15 25	-5 0
603	-21103	-0 66	6 4
1,053	"	16 0	30 5
331 991	"	"	12 5

and Death Rates (1941-50)

<i>D R</i> (<i>Differencing</i>)	<i>B R</i>	<i>B R</i> (<i>Reverse Survival</i>)	<i>B R</i> (1950)	<i>Registered</i> <i>B R</i>	<i>Registered</i> <i>D R.</i>
6	7	8	9	10	11
27 2	38 6	37 1	35 9	24 8	16 5
26 6	39 0	42 2	49 9	21 9	16 1
29 9	37 2	39 3		28 2	26 0
28 6	35 4	37 4† (35 3)	27 0	20 5	18 9
31 8	46 7	50 4† (49 8)	37 2	16 8	11 4
22 8* (19 1)	35 7 (34 0)	34 7		30 8	20 6
18 9	36 9	38 7		16 2	11 6
18 0* (13 7)	37 4 (35 4)	39 8	.	20 3	0 4
18 6	38 7*	38 7		17 2	14 3
24 9* (21 3)	41 0 (38 9)	41 8		32 9	22 6
24 9* (18 5)	42 2 (39 1)	42 4		.	...
38 5	46 1	45 1	39 9	37 0	30 3
35 8	44 2	44 3		.	.
29 5	43 1	47 2			.
27 2	42 5	47 9			
26 3* (18 2)	41 2 (36 6)	37 6† (40 8)	39 5	39 5	23 9
31 3	41 5	36 6† (37 9)	.	.	..
38 0	45 0	46 8† (46 5)	.	28 9	21 5
26 3*	41 2	45 3† (41 1)	..	29 9	14 1
27 4	39 9	39 2	.	27 5	19 7

*Calculated on other bases explained in paras (4 10) to (4 13)

† Adjusted rates see para. (5 2) of the note.

11.0% and 13.4%. The registered birth and death rates in these periods are 31.9 & 22.1, 34.7 & 22.3 and 30.8 & 20.6 respectively. These give the rate of natural increase as 9.8, 12.4, and 10.2 respectively. These rates for 1921-30, and 1931-40 reasonably agree with the corresponding growth rates of the periods considering that Madras has been a net emigrating State. The conclusion may be made that registration system in the State has worked well during 1921-40. Even allowing for a possible deterioration in the registration system during 1941-50, it seems difficult to reconcile a growth rate of 13.4% with the registered rate of natural increase of 10.2% except on the basis of a net fresh immigration gain. The higher growth rate for 1941-50 can well justify a net fresh immigration of 0.55% involved in the assumption of a 10% extra deaths if the operation of factor (a) is entirely ignored. This note attempts at fixing of only the levels of birth and death rates. It is difficult to claim accuracy for any precise figures calculated as the migration data are not on the firm bases. It seems fairly well established that the level of birth rate in Madras is near about 35 per mille and the death rate a little above 20 per mille. A birth rate of 35 is brought out also by an independent calculation by the reverse survival method.

(4.11) A similar conflict as has been noticed in the case of Madras is shown by the data relating to Bombay. The registered deaths at ages 5 and over during 1941-50 are 3,127,145, whereas the difference between 1941 population and 1951 population aged 10 and over excluding displaced persons is 3,327,103. The comparatively small difference between the two figures requires an explanation, considering that there is a big chunk due to mergers for which deaths are not included in the registration figure, although such deaths are taken into account in the above difference figure. The size of the chunk may be seen from the fact that 1941 population of Bombay State for 1941 layout was 20,849,849 as against the corresponding figure of 29,181,146 for 1951 layout after mergers. It is unnecessary to go over the general considerations discussed with reference to Madras in the preceding paragraph, they apply here equally well. Coming to their application in the case of Bombay it is seen that an improvement by 1/2% in the efficiency of enumeration would make a difference of about 1½ lakhs. A net immigration change in 1951 shown by the

estimates of migration figures leading to a net fresh immigration of 2.1% seems to be out of tune with the mean decennial growth rates recorded by the State. The growth rates during the last three intercensal periods are 12.1%, 14.5% and 19.9% (excluding displaced persons). The rate for 1941-50 is high and it seems improbable that it would have been so mainly due to higher survival of population through a very substantial lowering of death rate in the decade. The evidence for a substantial gain through net fresh immigration is strong when the registered birth and death rates are considered. The registered birth and death rates for the last three intercensal periods are 35.9 & 26.7, 37.2 & 25.1, and 32.9 & 22.6, giving the corresponding rates of natural increase as 9.2%, 12.1% and 10.3%. These percentages in 1921-30 and 1931-40 conform to the net immigrating position of the State. They also suggest a fairly good system of registration. On this basis, the big difference between population growth rate in 1941-50 (19.9%) and the rate of natural increase (10.3%) seems to point to a substantial net fresh immigration even if a deterioration in registration efficiency in 1941-50 is allowed for. On the assumption of a death rate equal to the registered rate (22.6), the migration change should be 623,706 leading to a net fresh immigration rate of 2.71% and a birth rate of 39.8. With 10% extra deaths, a death rate of 24.9 and birth rate of 41.0 is got involving net immigration change of 1,005,521 leading to a net fresh immigration rate of 3.77% during 1941-50. With extra deaths at 20% a death rate of 27.1 and birth rate of 42.2 is obtained, if it can be assumed that there was a net immigration change of 1,370,721 leading to a net fresh immigration rate of 4.78% during 1941-50. The rate of population growth in 1941-50 seems to justify a net immigration increase of 3.77% involved in assumption of 10% extra deaths. Accordingly, the birth rate of 41.0 and death rate of 24.9 are adopted for Bombay. The method of reverse survival gives a birth rate of 41.8. The computed death rate of 17.3 for Saurashtra and Kutch, a small unit, seems to be unacceptable when the death rate for Bombay is 24.9. Hence the death rate for Saurashtra as well as is taken as 24.9, which gives birth rate of 42.2. It requires a net fresh immigration rate of -4.3 as against, -7.45% brought out on the initial estimates of migration figures.

(4.12) The problem of Punjab seems to be complicated by the upheaval due to partition.

The number of Muslims emigrating is known to be large but the precise figure is not available, which makes any discussion on the lines adopted in (4.10) and (4.11) unhelpful. Accordingly, the true death rate has been taken to be 10% higher than the registered rate of 23.9. This gives a birth rate of 41.2 and a death rate of 26.3. Delhi, a small State, was seriously disturbed by the movement of population on partition. This makes the estimates of birth and death rates by the present method unreliable and hence Punjab rates have been assumed for Delhi also, and the corresponding figures of fresh migration rate has been worked out on the basis of the observed growth rate.

(4.13) The computed death rate for Travancore-Cochin seems to be unsatisfactory when compared to the death rate for Madras and Mysore. The registered death rate for Travancore-Cochin is incredibly low and affords no guidance for the calculation of the true rate. The death rate for the State has been taken to be below that for Madras and Mysore considering its slightly better health conditions. In the case of Travancore-Cochin the assumed death rate of 18 per mille requires a net fresh immigration rate of 1.8% against a net loss of -0.47% brought out on the estimates of migration figures by the Census Superintendent. The growth rates during the last three intercensal periods are 23.3%, 17.3% and 21.2%. The clue given by these figures as to the migration level is not clear. In support of a net fresh immigration gain during 1941-50 may be mentioned the return of a large number of war recruits who went out of the State immediately on the outbreak of war coupled with the industrial expansion during the decade. In this group the birth and death rates for Coorg, again a small State, which is easily affected by a small inaccuracy in the migration data, were determined by a different method. The birth rate adopted is based on the reverse survival method explained later and the death rate is derived from it with the observed growth rate and migration change based on estimated migration figures.

(4.14) The last four paragraphs describe the method of fixing a more reasonable figure for death rate or birth rate in cases where the one computed by the differencing method proved to be unsatisfactory in the light of other more reliable information. The units affected are small except those of Madras, Bombay,

and Punjab. The smallness of the units makes the computed rate liable to be considerably affected by any inaccuracy in the migration data. In the case of the three major States, the registration data are good enough to show up any appreciable effect of inaccuracy in the migration data or in other figures employed in the calculations of the computed rate. For the remaining States, registration data are so unsatisfactory that the effect due to any possible inaccuracy in migration data is insignificant compared to the registration deficiency and hence no conflict is reflected in the computations made here. The birth and death rates so determined for each State were applied to the mean population to determine births and deaths with a view to calculating births and deaths for All-India. The birth rate for India as a whole comes to 39.9 per mille and the death rate to 27.4 per mille. The rate of natural increase so brought out agrees with the observed mean decennial growth rate of 12.5%.

(5) Reverse Survival Method

(5.10) Birth rates shown in column 8 of table given in para (3.4) have been calculated independently on what is called the 'reverse survival' method. It is based on the fact that the population enumerated below 10 years of ages is the survivor of births in the inter-censal period. The Age Tables for 1951 in the column headed P_x give the required populations at individual ages below 10 for each State separately for male and female. In the terminology adopted in (3.24), N_x persons enumerated at age x are the survivors of $\frac{10}{L_x} \times N_x$ births. The factors $10/L_x$ and L_x should be taken from a life-table applicable to the area concerned. For this purpose, the male and female life tables for 1941-50 are appropriate, if the limitations are borne in mind. In the first instance, N_0 persons enumerated in 1951 as aged 0-1 are the survivors of births in 1950 under the operation of mortality applicable to their group as prevalent in 1950, which may be different from the overall mortality experience of 1941-50 life table. Again N_1 persons aged 1-2 are the survivors of 1949 births after passing through the mortality of 1949 and 1950 as applicable to them. Similar remarks apply to N_x for other values of x . Child mortality is liable to considerable fluctuations and the differences from the overall experience may result in considerable differences in the estimates of births in the individual years.

However, the force of this limitation is considerably reduced if estimates of births in the intercensal period are combined. In the second place, life tables for each State are not available. North India Zone life tables relate to U.P. alone and are, therefore, entirely suitable for calculating births in U.P. The life tables for Eastern India Zone apply to Bihar, Orissa, and Assam taken together, and therefore, births estimated for these States on the basis of these tables do not take any account of the peculiar child mortality experience of each State. These tables are applied to West Bengal also and this extension is based on a plausible assumption of the applicability of the life tables to the case. Similar remarks apply to life tables for other Zones. In the South India Zone table the mortality experience of Madras predominates. In the West India Zone, the Bombay experience dominates. In East and Central India Zones no one State has a dominant position. There are no life tables for North-West India Zone. As an expedient North India Zone life tables have been applied to Punjab, PEPSU, Himachal Pradesh and Bilaspur and Delhi and Central India Zone life tables to the other States in the Zone. The All-India life tables have been applied to India as a whole. On the other hand, under-enumeration of children which is widely believed to be affecting the Indian Census data, may lead to an under-estimate of births in the decade. Mis-statement of age is not such a seriously disturbing factor so long as the person is enumerated, but it should not be lost sight of. Child mortality particularly below age 5 changes so rapidly that a transfer of children from one age to another may make an appreciable difference. A clear appreciation of the above limitations would indicate that too much may not be seen in small differences in the calculated birth rates.

(5 11) The estimated births in 1941-50 calculated as above divided by the mean of the enumerated populations of 1941 and 1951, including displaced persons, give the mean birth rate for the decade. The birth rates so obtained are shown in column 8 of the table in para (3.4). The birth rate of 39.2 for All-India is unexpectedly close to the figure obtained by the earlier method. Similarly, the agreement in the estimates of birth rate by the two methods in the case of Bombay, Saurashtra, Madras, Madhya Bharat group and Madhya Pradesh is quite close. For

other States, the agreement is good enough but not so close. In the cases of Punjab and PEPSU group, the estimate by reverse survival is lower than that given in column (7) by 3.6 and 4.9 respectively. Bihar, Assam, Delhi, Hyderabad and Rajasthan show the largest differences of 3.2, 3.7, 4.1, 4.1 and 4.4 per mille respectively between the two estimates of their birth rates. Orissa, West Bengal and Travancore-Cochin are the other ones which show a considerable difference varying between 2 to 3 per mille. A higher estimate by 'reverse survival' may arise due to (a) an inflated enumeration of children below 10; this seems to have been a factor in certain States where the influx of displaced persons relative to its population size has been considerable and (b) the application of heavier mortality rates. These two factors are considered in the next paragraphs.

(5 12) Normal migration, if it is of a small order, as it generally is in the case of Indian States, does not deserve much consideration, but abnormal movement of the type following partition which affected certain areas particularly should be taken note of. Its effect on the estimate of children born and mean population may be considered separately.

(5 12i) Normally migration below age 10 is not considerable but due to this movement which took place under duress, the number of children enumerated below 10 at 1951 Census may have been appreciably affected in certain cases. The bulk of this migration took place in the second half of 1947. According to Census practices, as already mentioned, children born in the State of enumeration to displaced persons were not counted as displaced persons and, therefore, there would be, if at all, few displaced children below age 3 in 1951 enumeration. Displaced children would occur in the age period 3-10. A similar problem in connection with Muslim emigration is not of much relevance, as these emigrants are not counted in 1951 population. This emigration generally took place on a family basis. The children as well the population to whom they were born emigrated *en bloc* and neither of these appears in the figures of children or population at 1951 Census. However, some small adjustment in the calculation of mean population is called for in as much as a section of Muslim emigrants was present in 1941 Census in the form of a group whose survivors formed this section. The States appreciably

affected by the influx of displaced persons are, Punjab, PEPSU group, West Bengal, Assam, Delhi & Ajmer. In the case of these States, 1951 Census gives the number of children enumerated between 0-4 and 5-9. A rough and ready estimate of births of which these children are survivors, may be obtained by multiplying the group populations by $\frac{L_x}{L_2}$, where x represents mean age of the group. Here, 0-4 would consist mainly of children aged between 3 and 4 and hence L_x may roughly be taken as the mean of L_3 and L_4 . For group 5-9, x may be taken as 7. Thus, a rough estimate of births relevant to displaced children may be obtained. This estimate may be subtracted to get the births in the decade undisturbed by the inclusion of displaced children below age 10.

(5.122) The adjustment in the mean population referred to in the preceding paragraph in connection with Muslim emigrants would in most cases be only a minor refinement for introducing which the necessary data are not available. Where the migratory movement compared to the total population was not of a high order, the adjustment would not affect the resultant birth rate materially. However, where the efflux relative to the size of the population was heavy such as in Punjab, PEPSU, etc., adjustments seem necessary. There is considerable uncertainty about the number of Muslim emigrants, and coupled with it is the fact that the data necessary to estimate the population of the group in 1941 whose survivors in 1947 emigrated will have to be based on guess work. In the circumstances refinements are out of place and it would appear to be good enough for the purpose of assessing the effect on computed birth rate, if the mean of 1941 and 1951 enumerated population is simply reduced by half the estimate of Muslim emigrants in order to take them out of calculation. A similar adjustment in the mean population on account of the immigration of displaced persons may also be considered. In taking mean population as the average of 1941 and 1951 populations, it is implied that the change of population from 1941 to 1951 took place at a uniform rate in the decade, so that the changing population can be replaced by a constant population existent throughout the decade. The constant population is taken as 1941 population together with half the final increase in the decade. Thus, by taking the mean population as the average of

1941 and 1951 enumerated populations, half the population of displaced persons (enumerated as at 1951 Census) is taken to have existed during the decade. Actually, the displaced immigrants came in the second half of 1947, and were in the State during 3 1/2 years on the average. Allowing for deaths at 25 per thousand of 1951 population of displaced persons, the original displaced immigrants may be taken as 1.088 of the enumerated number. The mean displaced population that existed for 3 1/2 years of the decade may therefore, be taken as equivalent to 1.044 ($3\frac{1}{2} \times 1.088 \div 37$) of 1951 enumeration figure existent throughout the decade. This is short of half the population taken into account by .13 or roughly by 1/8. Thus, a rough allowance for the migration following partition may be made by deducting 1/8 of the displaced population enumerated in 1951 Census from the average of 1941 and 1951 enumerated population in addition to the deduction of half the Muslim emigrants as already discussed.

(5.2) The birth rates for the particularly affected States revised on the basis of the rough adjustments explained in (5.121) and (5.122) are as follows; for the sake of comparison the birth rate by the differencing method is also shown.

TABLE 2
Reverse Survival

State	Unadjusted	Adjusted	Differencing
Punjab	37.6	40.8	41.2
PEPSU Group	36.6	37.9	41.5
West Bengal	37.4	35.3	35.4
Assam	50.4	49.8	46.7
Delhi	45.3	41.1	41.2
Ajmer	46.8	46.5	45.6

The adjustment has a substantial effect in the cases of Punjab, West Bengal and Delhi. It has little effect in the cases of Assam and Ajmer. The rates for Punjab and PEPSU group are raised because they suffered a net efflux due to migratory movement on partition. The rates for

West Bengal and Delhi are decreased because they had a net influx. The adjustment has yielded closely agreeing rates by the two methods for Punjab, West Bengal and Delhi. The difference in the case of PEPSU, and Assam is still considerable.

(5.22) The other factor of the application of heavier mortality may be responsible for the still unexplained differences. The other States in the Central India Zone have a death rate of about 35 as against a death rate of 27.5 for Hyderabad. This indicates that the Central India Zone life tables may be a little too heavy for Hyderabad and hence may lead to higher birth rate by the reverse survival method. The same explanation holds for Rajasthan. A similar explanation applies to the case of Travancore to which the higher mortality table of South Zone dominated by Madras has been applied. The low birth rate obtained for PEPSU seems to be due to the adoption of low mortality tables for U. P., which has a death rate of 26.5 as against 30.6 for the PEPSU group. The difference in the cases of Bihar, Orissa and Assam do not appear to be so easily explainable. The life tables for East India Zone applied in their cases are based on data relating to these areas. It may be recalled that the infant mortality rates required for obtaining the mortality rates for ages 0-5 for the life table are based on guess work. This evidence seems to point to the fact that East India Zone life table mortality rates for ages 0-5 may be a little too heavy for Bihar, Orissa and Assam. The precise figures show some difference but the levels of birth rates in the two States brought out by the two methods agree very well.

(6.0) It is a matter for great satisfaction that birth rates calculated by the two independent methods support each other so well. From the discussion in the preceding paragraphs, it would appear that the estimates of birth rates given in column 7 and hence of death rates in column 8 to which birth rates are tied up through the observed mean growth rate may be relied upon. The birth rate by reverse survival for All-India is obtained independently of the estimates for the States by the application of All-India life table. Its agreement with the birth rate by the 'observed mean growth rate' method deduced from the estimated death rate for each State may be taken as an indication of the soundness

of the All-India life tables. In fact, the agreement of the two estimates for the States shows the soundness of the Zonal life tables.

(6.1) In Part II of the note an attempt has been made to estimate the birth rates for some States in the year preceding the Census from the number of enumerated infants. As a matter of interest those estimates are given in column (9) of Table I. These estimates relate to one year, and, in general, may have little relevance in the context of 1941-50 average rates. However, certain observations of a general nature seem possible. Except for Bihar, where the estimate has been noted to be abnormal, the birth rate obtained by this method is markedly below the other estimates shown in columns (7) and (8). This is so due to under-enumeration of infants, a factor to which attention has been drawn in that note. The best agreement is shown by U. P. and Punjab. Excepting Bihar the order in which the States are placed according to birth rates brought out by this method agree well with those obtained by the previous two methods. The main interest in the birth rates given in column 9 lies in the fact that the rates calculated by another independent method bring out the gross under-registration of births in certain States in a recent year.

(7) TABLE 3 given below shows the registered birth and death rates for the last three inter-censal periods, and the percentage of omissions in birth and death registration during 1941-50. The percentage expresses the ratio of the shortage of the registered rate to the corresponding rate given in column (6). The percentages obtained by Kingsley Davis by estimating births during 1926-30 by the method of reverse survival and comparing them with the registered births during the period are also shown.

Registration seems to be particularly bad in Assam. U. P., Bihar and West Bengal show high percentages. It is true that percentages of omission in death registration in Madras, Bombay and Punjab are comparatively low by assumption but the omission in birth rate brought out on this assumption seems to agree fairly well with Kingsley Davis's estimates in the cases of Madras and Bombay. Hence, the percentage of omission for death given for these States may not be wide off the mark. The very low figure of omission

for births shown for Punjab seems to be of doubtful significance. The population of Punjab in 1951 was less than what it was in 1941 due to migratory movement on partition. Up to 1947 the population was substantially higher than 1941 due to natural growth. It was abruptly depleted by migration on partition. The mean population obtained by taking the average of the registration area populations in 1941 and 1951, therefore, understates the population to which the registered births in the decade relate with the result that the birth rate derived therefrom is over-stated. This leads to a low figure of omission in births.

However, the position appears to be that registration system in the Punjab has worked fairly efficiently, and that the percentages of registration omission are not high. It is believed that the machinery broke down during partition and for the remaining inter-censal period it could not come up to the old efficiency. However, for the major part of the inter-censal period the State had the benefit of a properly functioning registration system. The subject of under-registration of births is further discussed in paras 12 & 13 in Part II of the note.

TABLE 3
Registered Birth and Death Rates and Percentage Omission

States		Registered			Computed rate	Percentage Omission in 1941-50		Kingsley Davis (1926-30) Percentage Omission in births
		1921-30	1931-40	1941-50		Deaths	Births	
1		2	3	4	5	6	7	8
U P	B R	34.0	34.2	24.8	38.6	39.3	35.8	25.4
	D R	25.6	21.9	16.5	27.2			
Bihar	B R	34.3	30.6	21.9	39.0	39.5	44.6	22.3
	D R	24.4	21.4	16.1	26.6			
Orissa	B R	37.3	35.7	28.2	37.2	15.0	24.2	22.3
	D R	30.8	28.4	26.0	29.9			
West Bengal	B R	28.7	27.5	20.5	35.4			41.6
	D R	26.1	20.9	18.9	28.6	33.9	42.1	
Assam	B R	27.1	25.6	16.8	46.7			45.6
	D R	20.8	17.2	11.4	31.8	64.1	64.0	
Madras	B R	31.9	34.7	30.8	35.7			16.1
	D R	22.1	22.3	20.6	22.8	9.6*	13.7	
Bombay	B R	35.9	37.2	32.9	41.0			22.8
	D R	26.7	25.1	22.6	24.9	9.2*	19.8	
Madhya Pradesh	B R	41.4	41.2	37.0	45.1			7.1
	D R	31.8	31.9	30.3	38.5	21.3	18.0	
Punjab	B R	40.6	43.0	39.5	41.2			25.3
	D R	30.4	26.3	23.9	26.3	9.1*	4.1	
Combined Part A States	B R	34.2	34.2	27.5	39.9	28.1	31.3	25.3
	D R	25.6	23.3	19.7	27.4			

*By assumption.

The percentage omission in births is shown to be generally slightly higher than the omission in deaths. The overall percentage of 31.3 for births for Part A States is slightly higher than that brought out by Kingsley Davis. The relative position of the States from the point of view of registration efficiency shown by the two sets of figures in columns (8) and (9) seems to be very much the same. In U. P., Bihar, Assam and Madhya Pradesh the percentage of omissions during 1941-50 are higher than those in 1926-30 suggesting further deterioration in registration efficiency. It may be of interest to mention that in U. P., a sample enquiry to verify births and deaths during Diwali 1947 to Diwali 1948 showed that 29.5% of births and 24.3% of deaths escape registration. In West Bengal the percentage omission of 42.1 is so high that there is little room for further deterioration. However, it may be pointed out that the results based on reverse survival method depend on the life table used. Kingsley Davis himself regarded the life tables used by him for the purpose as imperfect and hence small differences in percentages may not have much significance.

(8 o) Subject to the remarks in the concluding sentence of the last paragraph the estimates of Indian birth and death rates by Kingsley Davis, based primarily on the reverse survival method, may be considered along with the rates now obtained for 1941-50 to see the trends. The relevant figures are shown below. —

Excepting for 1941-50 all the rates shown in columns (2), (3) and (6) are taken from Davis' book. The registered rates relate to Part A States only. The figures in column (6) are the reciprocals of expectations of life at birth obtained from the life table applicable to the period multiplied by 1,000 to get rates per thousand. Life table data relate to a certain level of mortality experience, which is represented by the death rate given here. This is the death rate that will be shown by a community which has attained a stationary condition as regards age and sex composition and is subjected to the life table mortality rates. Naturally, this stationary community will have births equal to deaths in any period of time. Such a balance is never actually obtained, and, therefore, the death rate obtained from the expectation of life merely reflects the general mortality level to which the life table conforms. The absolute figure of death rate does not represent precisely the crude death rate in the actual population. As has been frankly stated by those who prepared Indian life tables the necessary data for deriving rates at childhood ages and particularly for infants are not available; they have to be guessed on insufficient factual data. In India infant deaths account for 20 to 25 per cent of total deaths and, therefore, are important in determining the precise figure of crude death rate in the country. The importance of having a correct idea of infant deaths for fixing the death rate in

TABLE 4

Decade	Estimated		Registered		Life Table
	B	R	B	R	D
1	2	3	4	5	6
1881-90	48.9	41.3			40.0
1891-00	45.8	44.4	34		42.0
1901-10	48.1	42.6	37		43.7
1911-20	49.2	48.6	37	34	49.8
1921-30	46.4	36.3	34	26	37.3
1931-40	45.2	31.2	34	23	31.5
1941-50	39.9	27.4	28	20	31.2

the entire population may be seen from the fact that according to 1941-50 Indian life table the death rate of 27.4 would change to near about 25 if the population over age 1 only be considered. Thus, from theoretical and practical considerations it appears that a good correspondence between the figure of actual death rate and that based on life table expectation of life may be obtained by chance. The latter rate serves merely as a broad indicator of the level of mortality.

(8.1) From the figures given in column (3) a substantial lowering in the level of death rate during the last three decades is evident. The birth rates in column (2) indicate a lowering in birth rate also, although the level remains more or less the same. It further seems clear that the comparatively accelerated increases in population recorded by the Censuses during the last three decades are due to saving of more lives through a substantial fall in death rate without corresponding decrease in additions to the population through a fall in birth rate. Compared to the decline during the preceding two decades, the lowering of birth rate in 1941-50 is more substantial, while the lowering in the death rate is smaller. In the light of the estimates of birth and death rates for the previous decades it is possible to hold the view that the figures for 1941-50 may be underestimated. A critical examination of the data on which the earlier estimates have been obtained does not rule out the possibility that they are overestimated. They represent the results of a laudable effort to get at the correct position with unsatisfactory data. A conservative appreciation of their value may be that they successfully bring out the levels of birth and death rates, although the precise figures by themselves may be out either way by a small margin. It may be recalled that the estimates of birth and death rates for 1941-50 have been obtained by independent methods and that the two rates fit well with the growth rate brought out by the Census. However, for the sake of argument if it be assumed that the true death rate for 1941-50 is about 30 per mille the birth rate would still be about 42.5 per mille as the mean growth rate for the period is 12.5%. Thus, compared to the previous two decades there is clear evidence for some lowering in birth rate during 1941-50.

(8.2) The registered birth and death rates bear out the same trends as have been indicated

in the preceding paragraph. However, the registered rates are at much lower levels compared to those of the estimated rates. A comparison of the birth rates given in columns (2) and (4) of table 4 shows that the percentages of omission in birth registration since 1891 through the successive decades were 26, 25, 23, 25 and 30. The percentage was never as high as it was in 1941-50. This seems to indicate a further deterioration in the registration system during the 1941-50 in India as a whole. Certain States show a more marked deterioration than others as has been shown in para. 7. The percentage omission in death registration was 28 in 1911-20 and 28, 26 and 28 in the successive decades. If it be held that the figures of estimated birth and death rates in the previous decades are overstated, the figures of percentage omission in the various decades would point to the system of registration having fared worst during 1941-50.

(8.3) A similar analysis at the State level as has been made in respect of All-India in para (8.1) could not be made. However, a consideration of the registered birth and death rates in the States during 1921-30 and 1931-40 shown in the Table 3 shows that in the various States true rates in these two decades would be appreciably higher than the corresponding computed rate for 1941-50, if an omission in the registration of births and deaths of more or less the same order as has been observed for 1941-50 can be assumed. The difference is sufficiently high to suggest a small decline in birth rate and appreciable fall in death rate in practically every State.

(9) It may not be inappropriate to conclude this note with a passing reference to the impact of this study on the problem of improving the registration of births and deaths in India. The study shows that in certain large States the present arrangements have yielded reasonably good results in so far as the counts of births and deaths are concerned. Till such time as it becomes possible to allocate the necessary finances for setting up a proper machinery for registration of births and deaths it seems practicable to achieve much better results from the existing machinery than are being obtained in several States, if only the various cogs in the wheel are properly geared up.

ANNEXURE II

PART II

Birth rates derived from infants enumerated

So far the subject of birth rates has been discussed at the State level. However, there is a distinct interest in the consideration of the subject at the level of lower units such as district. A very simple method, which is discussed in this part, is available for tackling this aspect of the subject with the help of Census data. The usefulness of the method is limited in as much as it yields results only in respect of the year preceding the Census. However, the actual study reveals several interesting features relating to infant enumeration in censuses and birth registration in India. Apart from this, the adaptation of the method to the Indian data has a methodological interest of its own.

2 Giorgio Mortara in the pamphlet on "Methods of Using Census Statistics for the Calculation of Life Tables and other Demographic Measures" issued by the United Nations Organisation has given an approximate relationship between the number of infants enumerated at a Census, the births in the preceding 12 months and the infant mortality rate as calculated in the usual manner by dividing infant deaths in a year by the number of live births in the year. This relationship is based on a certain ratio first observed by W. Lexis with reference to Belgium data in his classical work "Abhandlungen Zur Theorie der Bevölkerungs und Moralstatistik" (Jena, Fisher 1903). He found that of the infant deaths from amongst births in say, a calendar year $2/3$ occurred in the calendar year of birth and the balance in the following year. This relationship is not precise, but in the absence of more accurate data may serve as a useful hypothesis for certain investigation. Lexis was of the opinion that this approximate result may be observed in all countries but an extensive investigation into the matter with reference to the data of other countries seems to show that the ratio $2/3$ is more appropriate for populations with infant mortality rates between 100 to 200 per 1,000 live births. When the infant mortality rate becomes very low, this ratio may have a higher value. For instance, for U.S.A. the ratio would be $5/6$ according to 1939-41 experience and perhaps 5 should have an even higher value for 1949-51 when the infant mortality rate was reduced to 30 per 1,000 live births. In

the Western Countries where infant mortality has been very much reduced the reduction has been mainly in the mortality in the later period of infant life. Thus, in such countries deaths in the early infant period account for a large proportion of total infant deaths than they do in countries with higher infant mortality, there deaths in the later period of infant life are still substantially high. This explains why the $2/3$ ratio should be changed to a higher value in countries with low infantile mortality rates.

3 Giorgio Mortara kindly furnished details as to how this $2/3$ ratio was varied from the data relating to other countries. In para. 5 below the results obtained by similar method with the Indian data are given. The derivation of the ratio was straight forward in the case of Belgium data as information on infant deaths was available by months of age at death classified by calendar year of birth. In India, infant deaths in a calendar year are published for each State only by the period of life *viz.*, below 1 week to 1 month, 1 month to 6 months and 6 months to a year, and births are available by the month of occurrence. To determine infant deaths in a calendar year from amongst the birth of the year, it is necessary to fix the breakdown of the deaths recorded under the age groups by month of age. In consultation with Dr. Pandit, the Maternity and Child Welfare Adviser to the Government of India, it is considered reasonable to sub-divide the deaths recorded in the age period of one month to 6 months as 25% in the second month of life, 21% in the third month, 18% each in the fourth, fifth and sixth months. Similarly of the deaths in the age period 6 months to 1 year, 15% are ascribed to each of the seventh, eighth, ninth and tenth months, and 20% to each of the eleventh and the twelfth months. The considered view is that in India mortality in the eleventh and the twelfth months is comparatively higher than that in the immediately preceding months. Similarly, 40% of the deaths recorded between 1st week and 1 month are taken to have occurred in the second week, 30% in the 3rd week, and the rest 30% in the 4th week. These proportions determine the mortality experience in the relevant period of infant life. For instance, the mor-

tal rate in the period 1-2 weeks of life is $0.4q_2$ of the infant mortality rate where q_2 is the ratio of infants deaths recorded for the period of life 1 week to 1 month to the total infant deaths in the calendar year.

4. The number of monthly births multiplied by the infant mortality rate gives the number of infant deaths to be expected among them. To find out how many of these occur within the calendar year of birth, this expected number should be multiplied by certain factors which are determined as follows. Let in a specified period say a calendar year the proportion of infant deaths that occurred within 1 week of life be q_1 , that between 1 week to 1 month be q_2 , 1 month to 6 months be q_3 and 6 months to 1 year be q_4 . For India as a whole, covering all the major States, the actually observed values during 1947-49 were $q_1=0.231$, $q_2=0.222$, $q_3=0.306$ and $q_4=0.241$. For individual States the observed values varied considerably round these figures. Now in the calendar year of birth those born in January are exposed to the risk of infant death peculiar to all the first 12 months of age except on the average for half the mortality relevant to the twelfth month of age. The exception comes to $0.1q_4$ of the total infant mortality. Thus, of the infant deaths among the January births, a proportion $(1-0.1q_4)$ occurs in the same calendar year. Similarly in the calendar year of birth February born are exposed to the risk of infant death peculiar to all the 12 months of age except for the mortality of the twelfth month and half the mortality of the eleventh month. This exception means $0.3q_4$ of the total infant mortality and hence a proportion $(1-0.3q_4)$ of the total infant deaths among February born will occur in the calendar year of birth. Arguing in this way, we get the following factors of proportion for calculating deaths in the calendar year of birth:-

Month	Factor
January	$(1-0.1q_4)$
February	$(1-0.3q_4)$
March	$(1-0.48q_4)$
April	$(1-0.62q_4)$
May	$(1-0.77q_4)$
June	$(1-0.92q_4)$
July	$(1-q_4-0.09q_3)$
August	$(1-q_4-0.27q_3)$
September	$(1-q_4-0.45q_3)$
October	$(1-q_4-0.65q_3)$
November	$(1-q_4-0.88q_3)$
December	$(q_4+0.45q_3)$

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The expression for December needs a little further explanation. The month consists of 4 1/2 weeks. It will not be incorrect to assume a uniform distribution of births over the month, so that we can take 2/9 of the birth in the month to have occurred every week. During the calendar year, the births in the first week which on the average may be taken to have occurred on the midweek day are exposed to the mortality of the 1st month of life. Thus, of the total infant deaths in these 2/9 births in December a proportion (q_1+q_2) occur during the calendar year. The next 2/9 births that occur in the second week experience the mortality of the first three weeks and hence the factor of proportion for the births of second week is q_1+7q_2 . Similarly, for the births of the third week, it is q_1+4q_2 and for those of the 4th week it is q_1 . Regarding 1/9th births during the last half week, it is considered that they will experience 3/4 of the mortality of the 1st week and hence the proportion is $3/4 q_1$. Adding these proportions, we get the factor of proportion to be applied to the births in December to be:

$$\frac{2}{9}(q_1+q_2)+\frac{2}{9}(q_1+7q_2)+\frac{2}{9}(q_1+4q_2)+\frac{1}{9}q_1 \times \frac{3}{4} = \frac{35}{36} q_1 + \frac{2}{9} q_2 = q_1 + .45q_2 \text{ (approx)}$$

5. The values of q_1, q_2, q_3, q_4 were taken from the recorded statistics of infant deaths during 1947-1949 for each of the major States for each state for the period 1947-49 the number of infant deaths during the calendar year of birth from amongst the births in the year was calculated by applying the factors giving in para 3 above. The ratio of this number of deaths to the total infant deaths recorded during the period 1947-49 was then obtained. The results are given in col (3) of the following table :-

TABLE I

State	Infant Mortality rate per thousand	Percentage ratio	
		as calculated	as adopted
1	2	3	4
1 Madhya Pradesh	213	73.4	3/4
2 Orissa	184	76.1	3/4
3 Bombay	147	67.7	2/3
4 West Bengal	141	76.3	3/4
5 Punjab	139	69.1	7/10
6 Madras	132	70.6	7/10
7 Uttar Pradesh	107	66.6	2/3
8 Bihar	81	75.2	3/4
9 Assam	97	68.0	2/3
10 All States Combined	133	70.5	7/10

TABLE I

Column 4 shows the ratio that was adopted in the calculations described below. These results generally conform to the universal observation except to the extent that higher values of the ratio do not go with the lower values of infant mortality rate unlike what has been stated in para 1. It may be observed that the value of the ratio depends on the distribution of infant deaths by months of age. In the Western countries the reduction in infant mortality is the result of active public health and medical activities, which have largely resulted in reducing infant deaths in the later periods of infancy. This results in the infant deaths being concentrated more in the earlier portion of life. In India, the impact of hygienic and medical activities is not so effective in controlling infant mortality. The distribution of infant deaths by months of age is determined more by the peculiar conditions in a State. This may possibly explain the irregular variation of the ratio with reference to the level of infant mortality.

6. Suppose in a State there were b births in the 12 months preceding a Census. There will be $b \times r \times I$ deaths among them by the Census time. Here, r is the ratio $2/3$ or $7/10$ or $3/4$ as obtained in Table I and I is the infant mortality rate as recorded in the preceding year. Thus, E the number of infants enumerated at the Census is related to be as follows.—

$$E = b(1 - rI) \dots \dots \dots (1)$$

There are three variables E , b , I in equation (1). If two are known, the third can be calculated. Relying on the accuracy of E as given by the Census and of I as registered, we can get a good estimate of b . As the total population is known correctly from the Census, the birth rate thus obtained for the year preceding Census should be fairly reliable. It was primarily with an idea to obtain some estimates of birth rates in the year preceding the Censuses that data by districts giving the number of births registered in the 12 months preceding the Census date, recorded infant mortality rate during the preceding year and the infants enumerated were collected from the States for the last four Censuses. It is well known that in India none of E , r and I is known absolutely correctly. As is obvious, the reliability of the calculated rates depends on the accuracy with which E , r , and I are available. As regards the last, it does not appear that it need be known with perfect accuracy, as the final effect on the accuracy of b due to an approximation in I is not very substantial. The value of I for the various parts of

India may broadly be taken to be lying between 100 and 200 per 1,000 live births. The estimated births by taking $I = 0.1$ come out to be only nearly 7% lower than the estimate based on $I = 0.2$, taking $r = 2/3$ in each case. Infant mortality rate is a ratio of infant deaths to births, both of which are subject to omissions in registration though by varying degrees. As is shown in the next paragraph, the true rate can at the most be double of the recorded rate.

7. Let the birth registration efficiency as suggested by the proportion of registered births to the actual births be p and a similar infant death registration efficiency represented by the proportion of registered infant deaths to the actual infant deaths be q . Obviously, each of p and q is less than 1. Further, let B and D be registered births and infant deaths in a year and b and d be their true values.

Then, $B = pd$ and $D = qd$.

Observed infant mortality rate $I = \frac{D}{B} = q \times \frac{dc}{b} = \frac{qI}{p} \dots (1)$

Where I is the true infant mortality rate.

It is well known that circumstances which lead to the omission of births from being registered are stronger for the omission of infant deaths from being registered. Thus, p is greater than q . From relation (1), it then becomes obvious that the true infant mortality rate I is higher than the observed value I . Let the true rate of infant mortality be K times the observed rate. The ratio K is given by the relative proportions of births and infant death registrations.

The following table shows for the various values of K , the permissible percentage omission in infant death registration against the different levels of birth registration efficiency;—

p	Percentage Upper limit of percentage omission omission in infant deaths when births					
	$K=5/4$	$K=3/2$	$K=2$	$K=3$	$K=4$	
0.8	20	36	47	60	73	80
0.6	40	52	60	70	80	85
0.5	50	60	67	75	83	87
0.4	60	68	73	80	87	90
0.2	80	84	87	90	93	95

Objectively, there seems to be no evidence for fixing K but from the above limits, it seems

reasonable to take that the true infant mortality rate is at most twice the registered rate, it may well be less

8 There is little doubt that the true value of r is near about $2/3$. The calculations made above show that it may be $7/10$ or $3/4$ in some cases. The effect on the estimate of b for the variation in the value of r from $2/3$ to $3/4$ is very small. However, it is quite possible that the uncertainty in the value of r combined with that in the value of I may substantially affect the estimate of b . The following table shows the magnitude of this effect when r is taken as $2/3$, $7/10$ and $3/4$ in combination with the values of I taken at the true levels of 80, 160, 250 per 1,000 live births, which cover the range likely to be met in India. The figures given below show the percentage by which the estimated births come out to be higher than the number obtained by taking $r = 2/3$ and $I = 80$.

Infant mortality rate	$r=2/3$	$r=7/10$	$r=3/4$
80	.	0.3	0.7
160	6.0	6.6	7.6
250	11.4	14.5	16.6

9 From the discussions in the preceding paragraphs it is seen that a considerable amount of uncertainty in the value of I & r can be tolerated and yet a fairly good estimate of births may be obtained. However, the reliability of E directly affects the reliability of the estimated births to the same extent. As will be seen in the following paragraphs the number of infants enumerated at the past Censuses appears to be inconsistent with some other available evidence. This affects the reliability of the estimated births deduced from the above relationship. The number of infants enumerated in 1951 Census is generally more consistent and in this respect this Census appears to be an improvement over those in the past.

10 Table 2 shows the estimated births during the 12 months preceding the Census date obtained by the method in respect of the major States except Bombay, for which the data were not furnished. The figure of estimated births given in the table is calculated directly from the number of infants enumerated in the State as a whole. Alternatively it could be taken as the total of estimated births by districts in the State. Actual calculations show that the two agree very closely.

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TABLE 2

Normally, infants enumerated should be less than the registered births and so the ratio shown in column 6 would be less than 100. Instances, where the ratio is substantially above 100, give a clear proof of a considerable under-registration of births. It does not appear probable that the infants in a State could be enumerated materially in excess of the real survivors of births during the preceding 12 months, for the important factor which can inflate the enumeration figure is only net gain due to immigration of infants. In all probability there is an under and not over enumeration. From general considerations it does not appear probable that there is any substantial migration of infants at the States level. Thus there appears to be little reason to believe that enumerated figure is in any way inflated, if any thing, it may well be understated due to omission of infants from being recorded in the Census. The latter is a more true of the Indian Censuses. It therefore, appears that the extent of omission in registration brought out in cases where the ratio is above 100 may well be taken as an estimate on the lower side of under-registration of births in the relevant year. This would be so for another reason. The other factors besides E which are likely to affect the estimated births from equation (1) are the values of r & I . As would be clear from the explanations given in the preceding paragraphs the probable variation in r does not affect the results materially. If anything, the registered value of I , which is adopted in the calculations, is an under-estimate. The combined effect is that the expression $(r \cdot I)$ is overstated with the consequent result that the number of births from equation (1) is under estimated. Now the individual instances where infants enumerated exceed the register births may be considered.

Assam data consistently show in col. 6 a ratio exceeding 100. In 1951 this ratio shows an abrupt increase over the level in the preceding census years. Column (5) of the table gives the ratio of registered births to estimated births. The difference of the ratio from 100 gives an idea of the extent of under-registration of births, taking the estimated figure as the correct one. Thus, in Assam the under registration of births was by 21%, 34% and 27% in the years 1920, 1930 and 1940 respectively but in 1950 it was by 62%. There is little doubt about the sudden deterioration in the registration of births in recent years and these figures would seem to give a good indication of its extent. The estimated birth rate works out to 37 per mille.

as against 14 per mille registered in 1950. The estimated birth rate comes to 34, 39 and 33 per mille in 1920, 1930 and 1940 respectively. These estimated birth rates are fairly consistent and may, therefore, be taken to indicate the true level of the birth rate.

Considering other instances where the ratio in col. 6 exceeds 100, it is seen that a similar position is revealed by the data for 1950 relating to Bihar. The under-registration of births appears to be of the order of 65%. The estimated birth rate in 1950 comes to 50 per mille as against 18 per mille registered. The figure obtained for this one year does not seem to reflect the level of true birth rate in Bihar. Delhi shows a deficiency of 42% in the registration of births in 1950. The estimated birth rate in 1950 is 55 per mille as against 32 per mille registered.

Madhya Pradesh shows a deficiency of 16% in the registration of births in 1950. The estimated birth rate in 1950 comes to be 39 per mille as against 33 per mille registered. In the Punjab though the ratio in column (6) is less than 100, column 5 shows a deficit of 4%, giving an estimated birth rate of 40 per mille in 1950 as against 38 per mille registered. This is commented upon in the next paragraph. In U.P. the deficiency in the registration of births in 1950 was by 42%. The estimated birth rate in 1950 works out to 36 per mille as against 21 per mille registered. West Bengal shows a deficiency of 32% in the registration of births in 1950 and thus the estimated birth rate comes to 27 per mille as against 18 per mille registered. The estimated birth rate comes out to be much lower than in the other casts cited above. The ratio for 1931 also is above 100 and the deficiency in the registration of birth rate comes to 23%. From the above it appears that in respect of 1950 there is evidence of high degree of under-registration in Assam, Bihar, U.P., Delhi and West Bengal. It is also shown that the true birth rate in 1950 in most of the States was near about 35 to 40 per mille with the possible exception of West Bengal. It is, therefore, clear that the low registered birth rate noticed in the recent years is mainly due to a serious under-registration of births.

There are a few instances where the ratio in column (6) is below 100 but column (5) shows a deficient registration. Madras in 1921 shows a deficiency of 6.5% in registration. In U.P. there is an evidence of a small under-registration of births by 0.4% in 1931. The

Punjab data in 1931 and 1941 show a deficiency of 4% and 10% respectively. West Bengal data for 1921 shows under-registration by 10%. In Orissa an under-registration of 5.6% in 1941 is shown. In all other instances the infants enumerated are so much short of the registered births that the estimated births based on the enumeration figure come out to be lower than the registered births. This fact is reflected in the ratio in column 5 coming out to be above 100. This fact clearly points to the under-enumeration of infants at the Censuses. Leaving out Assam, practically all the past Censuses in the various States give evidence of under-enumeration of infants. Only 1951 Census data except those for Madras do not give evidence of under-enumeration according to the method adopted here.

With the help of relationship (1) given in para 6, it is easy to see that the ratio in column 5 is really the ratio of registered births to infants enumerated multiplied by the factor $(1-r)$. The factor is very nearly 1. If the registration of births be fairly good but infant enumeration be comparatively much worse the ratio in column 5 would come out to be above 100. This probably explains the higher value of the ratio in 1951 Census in the case of Madras. In para (13) some evidence is produced to show the poor infant enumeration in Madras in 1951. In 1951 Census ratio is very much below hundred in the case of Assam, Bihar, Delhi, U.P. and West Bengal, probably because infant enumeration efficiency is comparatively better than the birth registration efficiency. For the same reason, it is possible that the small deficiency in birth registration brought out for some States may in part be due to the under-enumeration of infants and not due entirely to better registration. The estimated birth rates as obtained here generally do not appear to be unreasonable when compared with the estimates for 1941-50 obtained in Part I. This is discussed in para (6.1) there.

11 From the above discussion it appears that the Census enumeration of infants in 1951 is sufficiently reliable for the applicability of equation (1) from which a fairly reasonable estimate of birth rate in 1950 can be obtained.

Although the results based on a study of the data for one year may lack the authenticity of those based on the data for a number of years, the ratio of registered births to the estimated births may be used to assess the completeness of registration in the various districts in a State.

However, it may be borne in mind that the number of infants enumerated in a district is likely to be affected a little more by migration than in the case when State is taken as a whole. The following table shows the percentage omission in birth registration, and the registered and the estimated birth rates in 1950. The birth rates have been calculated on the census population projected back by 6 months to accord with the midpoint of the year for which births are taken.

TABLE 3

In the above table percentage omission and estimated birth rate have not been given where the registered births exceed the estimated births. The value of I based on registration data is, if at all, an underestimate. As has already been seen in para 8, this would lead to slight under-estimation of births, but it seems unlikely that registered births will exceed the estimated births merely on this account. If the excess is substantial, it is more likely to be due to the under-enumeration of infants. In cases where a positive percentage omission is obtained it is not unlikely that there may be some under-enumeration of infants as well, and this would lead to a still higher percentage omission. These remarks shall be kept in mind in the following discussion.

12 The above table brings out the poor State of registration in every district in Assam. Even in Cachar, where percentage omission is the least, one third of the births escape registration. Kamrup and Nowgong seem to have the worst registration arrangements. Darrang and Sibsagar have a very high true birth rate. The birth rate in other districts are generally above 30 per mille. Similar seems to be the cases in Bihar, where registration is shown to be as bad as in Assam. It seems to be particularly poor in the districts of Saran, Saharsa, Purnea, Monghyr, Bhagalpur, Hazaribagh and Santhal Parganas. Purulia and Palamau seem to have about the best arrangements, but even here nearly one third of the births escape registration. Another remarkable thing is the high birth rate in most of the districts, of which Saran, Darbhanga, Purnea and Bhagalpur may be especially noted. Only Purulia, Dhanbad, and Singbhum have birth rates below 30 per mille.

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In Madhya Pradesh the percentage omission of births seems to be low in most of the districts. Only in Sagar, Mandla, Betul, Balaghat and Wardha the omission is substantial and over one third of the births are not registered. The omission seems to be particularly low in Nimar, Chanda and Amraoti. In Akola and Yeotmal, it is likely that a substantial number of infants may have escaped enumeration, which will probably explain why registered births exceed estimated births. In every district the level of birth rate is round about 40 per mille. In Punjab there is a substantial omission in the registration of births in the districts of Karnal but in Hissar, Rohtak, Gurgaon, and Ambala it is considerably low. In Hoshiarpur it is fairly low. In other districts the enumeration of infants appears to have been defective, which seems to be the reason why registered births exceed estimated births. This explains the low overall omission in birth registration for the State as a whole, although in the individual districts where it is possible to have some deal of under-registration it is not so low. In Punjab where the estimated birth rate can be calculated, it is well above 40 per mille. In the remaining districts the registered birth rate is generally between 35 and 40 per mille.

13 In the U.P. there is a wide range of omission in registration. The districts of Allahabad, Jaunpur, Partapur, Bahraich, Unao and Kheri are the worst but Etah, Faizabad, Gonda and Barabanki show omission from registration of over 50% of births. Almora and Garhwal are the only ones which show low percentage omission, but this may be due more to defective enumeration of infants in these hilly districts rather than due to better registration. Otherwise, practically no district shows omission by less than 20%. Barring Ballia, Gorakhpur, Deoria and Azamgarh practically all the districts have estimated birth rates well above 30 per mille. A good proportion shows birth rates above 40 per mille. Here, it will be of interest to mention that in U.P. a sample enquiry into the extent of under-registration in 44 out of 49 districts was conducted. The District Medical Officers of Health were asked to verify births and deaths for the period Diwali 1947 (12th November 1947) to Diwali 1948 (1st November 1948) in about 200 villages in each district and of these at last forty villages were required to be covered by a house-to-house enquiry. The details of the enquiry are published in Vol. LXXXVII No 4 of the Indian Medical Gazette, page 167-171.

(April 1952). The percentage omission of births obtained in the enquiry are shown in the extra column in the case of U.P. in Table 3. The enquiry covered rural areas only, but as over 85% of the population in the State lives in villages, the results of the enquiry may well be taken to reflect the conditions of registration in the individual districts, provided the statistical considerations were kept in view in the selection of the village and the conduct of the enquiry. It does not appear that the sample size is adequate for drawing inferences at the district level. However, it does not seem to be necessary to go into these considerations, when the object is to trace broad similarities in the results of this enquiry and the percentage omissions arrived at from the census data. The first point of interest is that omissions to the extent of 60% and 70% determined from the Census data were also obtained in the enquiry. The enquiry brings out a deficiency of 30% for the whole of the State, whereas the figure given by the calculations from the Census data is 42%. The Districts which show an exceptionally high percentage omission are Allahabad, Unao and Kheri in the sample enquiry also. In the enquiry of 40 districts surveyed 19 districts showed omissions of 30% or more and 18 of these have a high percentage omission according to the census data also. In 6 districts the percentage omissions are below 30% by both the methods. In the remaining 16 the percentage omission by one method is above 30% but below 30% by the other method. Considered on the whole, it may be said that the picture of under-registration brought out by the calculations from the Census data does not seem to be materially different from that shown by the survey.

In West Bengal the omission is particularly high in the districts of Burdwan, Bankura, Howrah, 24 parganas. It is low in Burdhum, Jalpaiguri and Darjeeling. The estimated birth rates in every district work out to be well above 20 per mille and are generally between 25 to 30 per mille. The data for Orissa are available only for three districts. There Cuttack and Puri show registered birth in excess of the estimated births probably due to under-enumeration of infants. Only Balasore shows a small deficiency. The birth rate in the districts in Orissa in 1950 seems to be near 30 per mille.

Madras is the only State which generally shows the estimated births to be lower than the registered births. The following table shows the number of infants enumerated in 1951 census and

the number of births registered in the preceding twelve months in some of the districts —

District	Infants	Registered Births
East Godavari	16,030	57,801
West Godavari	14,420	44,033
Madras	34,300	52,587
North Arcot	72,880	92,303
Coimbatore .	77,370	94,617
Tanjore .	60,580	80,224
Tirunelveli	58,100	77,211
Malabar . . .	121,180	150,167
South Kanara .	50,540	60,604

It is true that infants enumerated should be less than the registered births but not by so much as these figures show. The disparity in the figures for East and West Godavari is so glaring that no comments are needed. Taking the case of the Coimbatore which shows the nearest figures, calculations indicate that the infant mortality rate should be 260 per thousand in order that the number of infants enumerated may be the survivors of the registered births. If under-registration is also to be allowed for, infant mortality rate should be considerably higher. According to the registration records the infant mortality rate in the district was 114 only. It does not seem likely that the registered infant mortality rate is so grossly deficient. Considered similarly it seems there was under-enumeration of infants in most of the districts. Even in districts where the percentage omission is positive, it is low except in Chittoor and Nalgur. In the circumstances, the method is not appropriate and it is difficult to draw any reliable inference about the true level of birth rates in the State.

14. From the above remarks it appears that in states like Assam and Bihar registration is particularly bad, while in U.P. and West Bengal it is comparatively better though still had enough. In the major portion of Madhya Pradesh and Punjab, it is not very unsatisfactory. By the method adopted, it is not possible to draw any reliable inference about the state of registration in Madras. The data relating to Orissa are insufficient and those relating to Bombay are not available. As regards birth rate, it seems to be clearly established that where the registered rate is low, the percentage omission is high. This shows that the lower birth rate which is being shown in the recent years by the registration data is due more to under-registration than to any substantial reduction of births in the country.

TABLE 2

State		Census year	Infants Enumerated	Registered Births	Estimated Births	Ratio (3)/(4)	Ratio (2)/(3)
1		2	3	4	5	6	7
1 Assam	. . . . .	1951	269840	110138	290370	37.9	245.0
		1941	193500	156155	213200	73.2	123.9
		1931	186844	140649	212082	66.3	132.9
		1921	134858	122404	154796	79.1	110.2
2 Bihar	. . . . .	1951	1895918	705243	2008387	35.1	268.8
		1941	706800	1006005	770438	130.6	70.3
3 Delhi	. . . . .	1951	87440	54412	93880	58.0	160.7
		1941	20700	33859	23329	145.1	61.1
		1931	20084	24554	23165	106.4	81.5
		1921	17233	19733	.	.	87.3
4 Madras	. . . . .	1951	1280190	1538540	1405349	109.2	83.2
		1941	1140700	1584198	1292724	122.5	72.0
		1931	1139207	1463902	1308681	111.9	77.8
		1921	969269	1023656	1094972	93.5	94.7
5 Madhya Pradesh	. . . . .	1951	621586	604649	720429	83.9	102.8
		1941	408529	627946	485304	129.4	65.1
		1931	542593	664217	653254	101.7	81.7
		1921	388252	544081	470210	115.9	71.2
6 Punjab	. . . . .	1951	442870	479429	498727	96.1	92.4
		1941	362200	522404	420478	124.2	69.3
		1931	394957	437486	455177	98.1	90.3
		1921	381492	402369	444319	90.6	94.8
7. Uttar Pradesh	. . . . .	1951	2056050	1295505	2219158	58.4	158.7
		1941	1371700	1680595	1514853	110.9	81.6
		1931	1497778	1693173	1700758	99.6	88.4
		1921	1388700	1662192	1642848	101.2	83.5
8 West Bengal	. . . . .	1951	591474	440880	650686	67.8	134.2
		1941	565280	657603	632059	104.0	86.0
		1931	581962	517339	675600	76.6	112.5
		1921	510061	544372	603408	90.2	93.7
9 Orissa	. . . . .	1951	105300	132448	117104	113.1	79.5
		1941	153800	165961	175832	94.4	92.7

TABLE 3

District and State	% Omission	Registered Birth Rate	Estimated Birth Rate
I Assam	62.1	14.1	37.2
1. Cachar	33.3	19.8	29.7
2. Goalpara	59.9	12.2	30.4
3. Kamrup	87.0	4.4	33.8
4. Darrang	59.6	19.2	47.4
5. Nowgong	74.3	9.9	38.4
6. Sibsagar	55.2	21.9	49.0
7. Lakhimpur	56.3	14.0	32.0
II Bihar	64.9	17.5	49.9
1. Saran	77.0	15.8	69.0
2. Champaran	50.5	20.4	41.2
3. Muzaffarpur	53.0	21.6	45.9
4. Darbhanga	65.5	20.4	59.1
5. North Monghyr	66.3	16.7	49.5
6. Saharsa	78.5	11.4	53.0
7. Purnea	85.1	10.1	68.2
8. Patna	67.5	16.4	50.5
9. Gaya	49.1	25.8	50.7
10. Shahabad	45.7	24.8	45.8
11. South Monghyr	71.0	16.7	57.4
12. Bhagalpur	77.7	13.5	60.6
13. Hazaribagh	75.1	12.6	50.5
14. Ranchi	61.8	16.4	43.0
15. Purulia	32.0	16.7	24.6
16. Dhanbad	40.4	17.1	28.8
17. Palamu	32.4	22.6	33.5
18. Singhbhum	47.7	12.2	23.3
19. Santhal Parganas	79.4	9.7	47.0
III. Delhi	42.0	31.2	53.8
IV. Madhya Pradesh	16.1	33.5	39.9
1. Sagor	47.7	22.5	42.9
2. Jabalpur	26.0	35.9	48.5
3. Hoshangabad	18.4	34.1	41.8
4. Nimar	3.4	41.1	42.6
5. Mendla	34.6	27.7	42.4
6. Betul	36.0	25.1	39.3
7. Chhindwara	12.0	33.3	37.9
8. Bilaspur	20.2	28.9	36.2
9. Raipur	11.0	34.4	38.7
10. Durg	8.4	37.3	40.8
11. Chanda	4.3	35.9	37.5
12. Bhandara	7.5	37.3	40.3
13. Balaghat	35.8	30.6	47.6
14. Wardha	32.9	26.0	38.8
15. Nagpur	13.1	32.4	37.3
16. Amravati	0.1	36.6	36.7
17. Akola		37.2	
18. Buldana	15.6	39.3	46.6
19. Yeotmal		36.5	
V Punjab	3.9	37.9	39.5
1. Hissar	12.3	41.1	46.9
2. Rohtak	14.7	42.1	49.3
3. Gurgaon	13.6	38.2	44.2
4. Karnal	25.1	36.5	48.7
5. Ambala	14.8	38.8	44.9
6. Simla		30.9	
7. Kangra		33.1	
8. Hoshiarpur	5.9	39.4	41.8
9. Jullundur		39.8	
10. Ludhiana		37.6	
11. Ferozepur		37.2	
12. Amritsar		36.2	
13. Gurdaspur		34.8	
VI U.P.	41.6	21.0	35.9
1. Dehra Dun	24.2	13.3	27.4
2. Saharanpur	38.7	4.0	28.5
3. Muzaffarnagar	33.8	5.8	23.6
4. Meerut	36.5	10.5	26.0
5. Bulandshahr	31.0		29.4
6. Aligarh	48.2	38.2	21.0
7. Mathura	40.0	38.0	24.9
8. Agra	30.2	39.0	29.0
9. Mainpuri	46.8	23.9	22.6
10. Etah	53.0	21.0	23.6
11. Bareilly	31.0		23.6
12. Bijnore	29.2		25.5
13. Budaut	35.0	22.5	29.0
14. Moradabad	32.0	8.3	30.3
15. Shahjahanpur	43.1	39.5	20.0
16. Pilibhit	28.7	5.3	22.7
17. Farukhabad	46.4	25.5	20.9
18. Btawah	40.1	34.7	25.6
19. Kanpur	64.5		20.1
20. Fatepur	41.2	32.0	23.7
21. Aljhabad	70.2	59.9	
22. Jhams	42.2	10.0	24.1
23. Jalau	25.3	14.2	28.5
24. Hamirpur	38.7	16.7	24.6
25. Banda	43.2	13.3	22.2
26. Banaras	45.9		26.2
27. Mirzapur	26.3	50.6	22.0
28. Jaunpur	59.1	54.9	13.6
29. Ghazipur	25.5	19.7	25.3
30. Ballia	47.1	16.3	13.6
31. Gorakhpur	15.3	20.5	21.9
32. Deori	29.7	28.2	15.1
33. Basti	25.1		22.2
34. Azamgarh	31.5	44.4	18.2
35. Nounul	41.7		18.0
36. Almoa		6.6	29.2
37. Gashwal	13.5		29.6

District and State	% Omission		Registered Birth Rate	Estimated Birth Rate
	From census data	From enquiry		
38 Lucknow	35.3	35.0	24.1	37.3
39 Unao	72.5	59.8	9.5	34.5
40 Rae Bareilly	49.3	45.0	16.8	33.1
41 Sitapur	48.3	27.6	19.0	36.7
42 Hardoi	43.4	31.0	21.7	39.8
43 Khairi	60.0	71.2	14.2	35.5
44 Faizabad	53.4	34.5	14.7	31.6
45 Gonda	54.1	55.0	14.0	30.6
46 Bijnor	59.0	28.0	13.9	33.9
47 Sultanpur	45.0	43.8	15.9	28.9
48 Partapur	67.8	44.4	11.1	34.6
49 Bara-Banku	50.9	22.9	16.3	33.2

District and State	% Omission	Registered Birth Rate	Estimated Birth Rate
VII. West Bengal	32.2	18.3	27.0
1 Burdwan	46.0	16.2	30.2
2 Birbhum	9.4	19.7	21.8
3 Bankura	48.2	19.2	37.1
4 Midnapur	11.1	22.7	25.6
5 Hooghly	33.9	17.4	26.3
6 Howrah	47.3	13.1	24.9
7 24 Parganas	46.4	13.1	24.7
8 Calcutta	16.0	19.2	22.9
9 Nadia	25.9	15.4	24.0
10 Murshidabad	32.9	22.8	34.0
11 Medinipur	36.5	19.4	30.6
12 West Dinajpur	23.1	18.0	23.5

District and State	% Omission	Registered Birth Rate	Estimated Birth Rate
13 Jalpaiguri	2.3	27.3	28.1
14 Darjeeling	3.9	25.3	26.3
VIII Orissa	..	29.3	..
1. Cuttack	..	28.0	..
2 Balasore	12.5	25.1	28.7
3 Puri	..	35.6	..
IX Madras	...	29.1	..
1 East Godavari	..	23.9	..
2 West Godavari	..	25.9	..
3 Krishna	2.7	28.0	28.8
4 Guntur	..	28.7	..
5 Nellore	6.5	26.4	28.3
6 Cuddapah	2.9	28.2	29.0
7. Kurnool	5.6	33.9	35.9
8 Ballary	7.5	34.5	37.3
9 Anantapur	..	35.7	..
10 Madras	..	37.1	..
11. Chingleput	..	28.1	..
12 Chittoor	22.7	27.3	35.4
13 North Arcot	..	32.3	..
14. Salem	12.3	24.0	27.3
15. Coimbatore	..	28.7	..
16 South Arcot	..	29.4	..
17. Tanjore	...	26.9	..
18. Tiruchirappalli	..	26.5	..
19. Madurai	..	26.8	..
20. Ramanathapuram	..	30.3	..
21. Tirunelveli	..	31.6	..
22. Nilgiris	42.5	27.5	47.8
23. Malabar	..	31.6	..
24. South Kannara	..	34.7	...

ANNEXURE III

Logistic Graduation of Maternity Data : and derivation of Table of Age Specific Maternity Rates.

(By *Shri P. N. Kaul, Central Tabulation Officer*)

THE 10 percent sample data on maternity collected during the 1951 Census and published in this paper relate to all women (other than unmarried women) in Travancore-Cochin and the three divisions of Madhya Pradesh. This note relates only to those mothers who were still married on Census day and explains the results of an attempt to fit a curve to the observed values of Child birth indices or "average number of children born" to each mother of different maternal groups.

2 All the mothers are divided into four groups according to the age at which they had their first child birth. The four groups are as

follows —

	<i>Age at birth of First Child</i>
Maternity Type A	15 to 19
Maternity Type B	20 to 24
Maternity Type C	Over 24
Maternity Type D	Under 15

This is the observed order in every natural division. The maternity type D is found to be numerically insignificant. Both maternity types C and D taken together account for a little more than one tenth of the total number. Accordingly curve fitting was attempted only for the maternity types A and B. The table below furnishes the figures of child birth indices computed from the maternity data of these two States.

TABLE I

<i>Child birth indices (Number of children born per mother)</i>								
<i>Division→</i>	<i>Travancore-Cochin</i>		<i>East Madhya Pradesh</i>		<i>North-West Madhya Pradesh</i>		<i>South-West Madhya Pradesh</i>	
<i>Age of the mother at birth of first child→</i>	15-19	20-24	15-19	20-24	15-19	20-24	15-19	20-24
<i>Present age of the mother</i>	1	2	3	4	5	6	7	8
All ages	4.6	4.0	4.5	4.0	4.5	3.9	4.4	4.1
Completed Maternity (Mothers aged 45 and over)	7.3	6.4	6.8	5.9	6.9	6.0	7.1	6.2
Incomplete Maternity								
(1) 15-19	1.2	.	1.3		1.3		1.3	
(2) 20-24	2.0	1.3	2.2	1.4	2.4	1.5	2.2	1.3
(3) 25-29	3.6	2.3	3.7	2.4	3.7	2.2	3.7	2.2
(4) 30-34	4.8	3.7	5.1	3.7	4.9	3.7	5.0	3.5
(5) 35-39	6.0	4.9	6.0	4.8	5.9	4.7	6.0	4.7
(6) 40-44	6.8	5.8	6.4	5.5	6.5	5.4	6.6	5.5

3. The child birth indices were plotted against the age of the mother for the maternity types A and B, one for each division. The plotted points were observed to fall along a logistic shaped curve. Therefore a curve of the type

$$Y_t = L / (1 + e^{-\frac{\beta - t}{a}})$$

(where Y is the child birth index at time t and L , β and a are constants) was fitted by the method of 3 selected points. The median ages of the Incomplete Maternity groups (1), (3) and (5), were selected as the points through which the curve should pass. The values of L , β and a which were obtained for 8 child birth curves are shown in table below

TABLE II

Division→ Age of the mother at birth of first child→	Travancore-Cochin		East Madhya Pradesh		North-West Madhya Pradesh		South-West Madhya Pradesh	
	15-19	20-24	15-19	20-24	15-19	20-24	15-19	20-24
Parameters								
	1	2	3	4	5	6	7	8
L	.	7.64	6.78	6.68	6.22	7.18	6.02	7.21
B	.	29.09	31.49	26.22	30.04	27.23	29.53	27.37
a	.	6.42	6.35	5.22	6.22	6.57	6.13	6.09

4. Table III below shows the comparison of the observed values of child birth indices (in table I) and corresponding graduated values read off from the curves (in table II) for the

median ages of quinquennial age groups below 45. For age groups 45 and over the asymptotic value (L) is furnished for comparison in the column for graduated values.

TABLE III

Division→ Age of the mother at birth of first child	Child birth indices							
	Travancore-Cochin		East Madhya Pradesh		North-West Madhya Pradesh		South-West Madhya Pradesh	
	Observed value	Graduated value	Observed value	Graduated value	Observed value	Graduated value	Observed value	Graduated value
Age group								
	1	2	3	4	5	6	7	8
15-19	15-19	1.2	1.0	1.3	1.1	1.3	1.3	1.2
	20-24	2.0	2.0	2.2	2.2	2.4	2.4	2.2
	25-29	3.6	3.3	3.7	3.7	3.7	3.7	3.6
	30-34	4.8	4.8	5.1	5.1	4.9	4.9	5.0
	35-39	6.0	6.0	6.0	6.0	5.9	5.9	6.0
	40-44	6.8	6.8	6.4	6.4	6.5	6.5	6.6
20-24	45 & over	7.3	7.6	6.8	6.7	6.9	7.2	7.2
	20-24	1.3	1.3	1.4	1.4	1.5	1.5	1.3
	25-29	2.3	2.3	2.4	2.5	2.2	2.5	2.3
	30-34	3.7	3.7	3.7	3.7	3.7	3.7	3.5
	35-39	4.0	4.0	4.8	4.8	4.7	4.7	4.7
	40-44	5.8	5.8	5.5	5.5	5.4	5.4	5.5
45 & over	45 & over	6.4	6.7	5.9	6.2	6.0	6.0	6.5

5. Since the observed values and the values read off from the curve are sufficiently close, it is assumed that the logistic curve may be accepted as a reliable basis for estimating the child birth index corresponding to any individual year of age. Accordingly, values of Y_t (which are deemed to be child birth indices of mothers of age t) have been computed from the logistic curve for each age from age 15 to age 44. At this stage, the following assumption was made viz :—If at the beginning of the year, the average number of children born to mothers of age t is Y_t , and to mothers of age $t+1$ is Y_{t+1} , the average number of children born to the former by the end of the year would be Y_{t+1} . Hence the number of children born during a period of one year to 1000 mothers of age t would be 1000 ($Y_{t+1} - Y_t$). The number may be referred to as the "Age Specific Maternity Rates." Accordingly a series of values for 1000 ($Y_{t+1} - Y_t$) have been computed and set out in 'Table of Age Specific Maternity Rates' (Table IV). The validity of these rates is necessarily dependent on the validity of the assumption made above. It seems to be a reasonable assumption to make, at any rate as a working hypothesis, to be confirmed or revised on the basis of further study. Even if the as-

sumptions were valid, an error might still be imported into these rates if, for any reason, the basic data contained an element of systematic statement which might be present in the returns of the 'number of children born' would be reflected in the child birth indices and might also be reflected in the maternity rates. In view of the possibility of forgetfulness among the older women, the possibility of a systematic error cannot be overlooked.

6. The table 'Age Specific Maternity Rates' gives the number of married women of age specified in column (1) who may be expected to have a child-birth during a period of 12 months. Hence the corresponding proportions may be treated as giving the probability that a woman in a specified age gives birth to a child. It is assumed that the number of cases in which twins are born or in which the same mother gives birth to two children—one at the beginning and the other at the end of the 12 months period—is negligible. On this basis, it is possible to deduce the 'crude birth rates' and compare them with 'registered birth rates', as shown in the Table IV.

TABLE IV
Age Specific Maternity Rates

		Number per 1,000 married women of age specified in column (1) who may be expected to have child birth during a period of 12 months							
Maternity Type→ Age (In number of complete years)	Division→	Travancore-Cochin		East Madhya Pradesh		North-West Madhya Pradesh		South-West Madhya Pradesh	
		A	B	A	B	A	B	A	B
1		2	3	4	5	6	7	8	9
15		114		129		135		129	
16		129		150		149		146	
17		145		170		165		163	
18		161		194		181		181	
19		178		217		197		200	
20		196	136	240	146	213	149	219	135
21		213	152	263	161	227	165	236	148
22		231	168	282	177	241	179	253	163
23		248	184	299	192	252	195	268	178
24		262	200	312	206	262	208	280	192
25		275	215	318	219	268	221	289	206
26		286	229	320	231	272	231	294	218
27		293	242	315	240	273	238	296	228
28		296	253	305	246	271	241	293	235
29		297	260	290	249	265	248	287	246
30		294	265	271	249	257	244	277	250
31		287	267	251	247	246	239	264	249
32		277	265	227	240	233	231	249	248
33		264	260	204	231	220	221	232	243
34		251	253	180	221	204	209	214	236
35		234	242	159	207	185	196	195	226
36		216	228	138	193	175	180	177	215
37		199	216	118	178	157	165	158	202
38		182	200	102	162	141	150	142	188
39		164	183	86	147	127	135	125	174
40		147	168	74	132	113	120	110	160
41		132	151	62	119	101	107	97	144
42		116	137	52	104	88	95	84	131
43		103	121	43	98	79	82	73	118
44		91	108	37	76	68	57	63	105

TABLE V

Division	Upper Limit Estimate Birth Rate		Registered birth rate (1941-50)	Number of unregistered births per 100 registered births (Upper Limit Estimate)	
	1951	1941-50			
1	2	3	4	5	
Travancore-Cochin	36.6	36.8	20.3	81	
Madhya Pradesh	East	44.8	46.4	35.2	32
	North-West	40.5	41.7	36.8	13
	South-West	42.8	43.5	39.4	10

The figures of column 2 and column 3 of the foregoing table were obtained as below

First,—the upper limit of the probability that any married female of a given age will have a child birth during a period of twelve months was taken to be the higher of the two values furnished for maternity types A and B in the table annexed.

Secondly,—maternity rates were then deduced for all five-year-age groups of incomplete maternity on the assumption that the rate for the five year age groups is the same as that of the mother of median age in that group. The median ages are 17.471, 22.381, 27.368, 32.393, 37.411 and 42.632 for Travancore-Cochin and 17.404, 22.503, 27.471, 32.415, 37.390 and 42.388 for each of the three divisions of Madhya Pradesh. The median ages have been worked out from the smoothed age table for females. The rates for the three ten year age groups 15 to 24, 25 to 34 and 35 to 44 were then determined by combining pairs of rates for corresponding quinquennial groups, the rates being weighted by the number of mothers in each quinquennial age group (15 to 19, 20 to 24 etc.)

Thirdly,—the number of married females in each of the three ten year age groups mentioned

above for each of the four territorial units are known both for 1951 and for 1941 from Census tables. Applying the rates to these numbers the upper limit to the total number of live births to be expected in a twelve months' period can be computed and the corresponding upper limits of the Birth Rates determined therefrom.

There are other methods (entirely independent of maternity data) by which the Birth Rate as, well as the extent of omissions present in registration of births, may be estimated

7 After the foregoing analysis was completed similar data were received from West Bengal. This data was collected for villages of West Bengal, in the course of a "Training Sample Census" which had been undertaken shortly before the 1951 Census, in order to provide training to Enumerators and Supervisors. Though the size of sample is much smaller the data appeared to be promising. Logistic graduation was attempted and other computations made in the same manner as explained above. The results are set out in three tables (Tables VI to VIII) which show the Child Birth Indexes and Age Specific Maternity Rates for villages in two groups of districts of West Bengal.

TABLE VI

Districts/Age Groups		Grass Depth Index	
		Grass 1	Grass 2
1		2	3
Burdham, Bankura, Howrah, 24-Parganas, Malda and West Dinajpur	15-19 . . .	1.4	1.3
	20-24 . . .	2.3	2.3
	25-29 . . .	3.5	3.5
	30-34 . . .	4.7	4.7
	35-39 . . .	5.5	5.6
	40-44 . . .	6.2	6.2
	45 and over . . .	6.3	6.8
Burdwan, Nadia, Murshidabad and Jalpaiguri	16-20 . . .	1.5	1.4
	21-25 . . .	2.5	2.5
	26-30 . . .	3.5	3.9
	31-35 . . .	5.0	5.0
	36-40 . . .	5.9	6.0
	41-45 . . .	6.5	6.5
	46 and over . . .	6.3	7.1

TABLE VIII

Duration→		1941-50	1941-50
Age Groups		1941-50	1941-50
1		2	3
Age group specific Mortality Rates (Number per 1,000 married women who may be expected to have child born during a period of 12 months)	15-19	1.7	1.6
	20-24	2.0	2.1
	25-29	2.4	2.4
	30-34	2.4	2.2
	35-39	1.5	1.5
	40-44	1.1	1.1
	45-49	2.0	2.1
	50-54	2.3	2.4
	55-59	1.1	1.2
Crude Birth Rate	1951	24.6	23.1
	1941	1.2	26.7
Mean Decennial Birth Rate	1941-50	35.5	37.4

APPENDIX III
REVIEW OF CENSUS ECONOMIC DATA

APPENDIX III

Review of Census Economic Data

PART—A

Census questions, definitions and classifications

I—1951 CENSUS QUESTIONS AND INSTRUCTIONS

THE Census is concerned with two economic characteristics of every individual—his (or her) economic status and his (or her) means of livelihood. The scope and meaning of these expressions will appear from an explanation of three census questions, viz :—

Question 9 — ECONOMIC STATUS;

Question 10 — PRINCIPAL MEANS OF LIVELIHOOD, AND

Question 11.— SECONDARY MEANS OF LIVELIHOOD

(2) FORM OF QUESTIONS :

Question 9 — ECONOMIC STATUS :

Part One.— DEPENDENCY— Write '1' for a self-supporting person, '2' for a non-earning dependent, and '3' for an earning dependent. Write the answer in the first compartment.

Part Two — EMPLOYMENT— If a self-supporting person earns his principal means of livelihood as an employer write '1'; as an employee write '2'; as an independent worker write '3'. Write '0' in other cases. Write the answer in the second compartment.

Question 10.— PRINCIPAL MEANS OF LIVELIHOOD :

An answer to this question should be recorded on every slip. If the slip relates to a self-supporting person record his principal means of livelihood. If the slip relates to a dependent (whether

earning or non-earning) record here the principal means of livelihood of the self-supporting person on whom he is dependent. The means of livelihood which provides the largest income is the 'principal means of livelihood' for a self-supporting person who has more than one means of livelihood. In the case of other self-supporting persons it is the only means of livelihood.

Use the following contractions :

Write '1' for a person who cultivates land owned by him; '2' for a person who cultivates land owned by another person, '3' for a person who is employed as a labourer by another person who cultivates land, '4' for a person who receives rent in cash or kind in respect of land which is cultivated by another person.

For all other means of livelihood write fully and clearly what the person does in order to earn his livelihood and where he does it.

Question 11 — SECONDARY MEANS OF LIVELIHOOD :

For a self-supporting person who has more than one means of livelihood write the means of livelihood next in importance to his principal means of livelihood. For an earning dependent write the means of livelihood which provides the earning. Use contractions given in Question 10.

For a self-supporting person who has only one means of livelihood write '0'. In the case of a non-earning dependent also, write '0'.

(3) Question 9.— **ECONOMIC STATUS :**

This question is in two parts. The first part requires the labelling of every person as 'a self-supporting person', or 'an earning dependent' or a 'non-earning dependent'. Every single human being must be allotted one of these labels and not more than one of them, and this may be referred to as his 'household economic status'.

The second part of the question has no application to non-earning dependents or to earning dependents. It relates only to self-supporting persons, and even among them, those exceptional cases of self-supporting persons who support themselves without gainful occupation or economic activity (e.g. rentiers and pensioners) are not covered. All others (that is, all those self-supporting persons who are both economically active and gainfully occupied) are to be allotted one or other of the three labels viz., 'employer', 'employee', or 'independent worker', and this may be referred to as his 'employment status'.

The following extracts from the model-instructions to enumerators explain the criteria to be applied and the treatment of border-line cases

Where a person is in receipt of an income, and that income is sufficient at least for his own maintenance then he (or she as the case may be) should be regarded as a 'self-supporting person'. Such income may be in cash or kind

Anyone who is not a 'self-supporting person', in this sense, is a 'dependent'. A dependent may be either an 'earning dependent' or a 'non-earning dependent', the test is whether or not he secures a regular income, even though it may be small. Where the income which he secures is not sufficient to support him, that person is an 'earning dependent'. A person who does not secure any income either in cash or in kind, is a 'non-earning dependent'

Where two or more members of a family house-hold jointly cultivate land and secure an income therefrom, each of them should be regarded as earning a part of the income. None of them is, therefore, a non-earning dependent. Each of them should be classed as either a self-supporting person or an earning dependent according to the share of income attributable to him (or her). The same applies to any other business carried on jointly

This does not mean that anyone who works is necessarily a self-supporting person or an earning dependent. Thus, for instance, a housewife who cooks for the family brings up the children or manages the household is doing very valuable work. Nevertheless, her economic status is that of a non-earning dependent, if she does not also secure an income.

(An) Employer (is) only that person who has necessarily to employ other persons in order to carry on the business from which he secures his livelihood. A person (who) employs a cook or other person for domestic service should not be recorded as an employer merely for that reason

Persons employed as managers, superintendents, agents, etc (who) control other workers are also employees only, and should not be recorded as employers

An independent worker means a person who is not employed by any one else and who does not also employ anybody else in order to earn his livelihood

(4) Question 10.— **PRINCIPAL MEANS OF LIVELIHOOD:**

'Means of livelihood' of any individual ordinarily means the gainful occupation which forms the source from which that income which is utilised for his maintenance is normally derived, but it is more comprehensive, in as much as in exceptional cases, income may be secured without gainful occupation. 'Principal means of livelihood' means the same thing as 'Means of livelihood' for every person who has only one means of livelihood. Where a person has more than one, that which gives him the greater part of his income is his 'Principal means of livelihood'. In the sense thus defined, 'every' human being, without any exception, has a principal means of

*The Indian Census Economic Classification Scheme describes two different aspects of economic status which are ascertained by two different parts of question 9 as 'primary economic status' and 'secondary economic status'. It seems preferable to refer to them as 'household economic status' and 'employment status'. The second part of the question was an innovation of the 1931 Census. It was put in, because of increasing demand for the information and in spite of uncertainty about the possibility of its creating confusion similar to the 'industry' question of 1921 and 1941 Censuses, which was abandoned at this census.

livelihood—whether or not he is a self-supporting person Every non-earning dependent is maintained exclusively by the income of some self-supporting person on whom he is dependent Consequently, the principal means of livelihood of the latter is required to be recorded as the principal means of livelihood of the former The same rule applies to earning dependents also (no attempt being made to assess the degree of sufficiency of his own income or the extent of his dependence on others)

Agricultural and non-agricultural means of livelihood are distinguished by the manner in which enumerators are required to record the answers to this question This is important for purposes of subsequent classification of the answers The following extracts from instructions are relevant :

Four simple contractions have been provided which will cover most cases where the livelihood is dependent on agriculture—Write '1' for a person who cultivates land owned by him ; '2' for a person who cultivates land owned by another person , '3' for a person who is employed as a labourer by another person who cultivates land ; '4' for a person who receives rent in cash or kind in respect of land which is cultivated by another person If you find that a person falls under two of these categories note that category which provides the largest income against question 10 and the second against question 11 No note need be taken of more than two such categories in any case

[NOTE—The word 'owned', used in relation to land includes every tenure which involves the right to permanent occupancy of land for purposes of cultivation Such right should be heritable, it may be, but need not necessarily be, also transferable]

In all other casesWrite fully and clearly what the person does in order to earn his livelihood and where he does it There are three lines on the slip provided for answering this question Use them fully Avoid vague and general terms Do not write 'service', or 'labour' If you are enumerating a trader, describe the articles in which he is carrying on trade and state clearly whether he is a wholesale trader or a retail trader A retail trader sells to the public A wholesale trader does not. If you are enumerating a factory worker give the name of the factory or the product it

makes, e g., coal mine, jute factory, cotton mill, etc

(5) QUESTION 11.—SECONDARY MEANS OF LIVELIHOOD:

A self-supporting person may or may not have more than one means of livelihood. If he has more than one, that which provides the greatest income is recorded under question 10 as the 'principal means of livelihood' and the next under question 11 as the 'secondary means of livelihood'. It has been laid down that no note should be taken of more than two such means of livelihood in any case

The answer to this question is invariably 'nil' for non-earning dependents *Ex-hypothesi* they secure no income, they are supported by the principal means of livelihood of the persons on whom they are dependent which alone is taken to be their only means of livelihood

In the case of every earning-dependent, there are two means of livelihood which are combined in order to support him One is the principal means of livelihood of the person on whom he is dependent The other is the source wherefrom he secures his own income The former is always to be treated as the 'principal means of livelihood' of the 'earning dependent' ; and the latter as his 'secondary means of livelihood'.

Further elucidation of the scope and implications of these questions was provided in supplementary instructions in the form of question and answer. These are extracted below.

(6) CENSUS QUESTION 9 (1) .

Question — In the instruction the words are "the test is whether he secures a regular income, even though it may be small " Does the use of the word 'regular' rule out persons who earn an income by seasonal employment ?

Answer.—No. The word 'regular' is used in the sense of 'non-casual' It is not intended to be confined only to income derived from continuous employment It also includes income derived from seasonal employment 'What it does exclude is individual-income accruing casually and not constituting a source of income which is regularly depended upon

Question — The word 'self-supporting', as defined in the instructions, means any person whose income is sufficient at least for his own maintenance. Does this mean that an income sufficient for one

man is self-supporting income? What about his direct dependents—wife, children etc.?

Answer.—Yes. The instructions mean what they say. A person must be deemed to be self-supporting if his income (such as it is) is sufficient to support him individually at his present level of living (such as it is). He does not cease to be self-supporting merely for the reason that he, his wife and children taken together are not maintained by his own income.

If the wife and children have no income of their own, they are non-earning dependents. The instructions provide that their principal means of livelihood should be deemed in every case to be the same as that of the person on whom they are dependent. This would in most cases be the husband or father who will also be the head of the household. In those exceptional cases where the husband or father is not the head of the household, and is also not able to support anyone but himself, then the head of the household in which the non-earning dependent is living is the person on whom he (or she) is dependent.

Remember—every 'family household' is (collectively) self-supporting, otherwise it would not exist. The surplus of self-supporting persons within a family household is in every case sufficient to meet the deficit on the earning and non-earning dependents in that family household.

Question.—In the instructions it is provided that if two or more members of the family households jointly cultivate land they would be classed as self-supporting or earning dependent "according to the share of income attributable to him or her". How are these shares to be assigned? What about females who, in some cases, take an active part in agricultural operations?

Answer.—The share of the income attributable to a person is what the head of the household (or whoever is the managing member) deems it to be. No attempt should be made to make a detailed calculation of this share. All that has to be ascertained is whether (in the opinion of the head of the household or managing member) the member concerned is entitled to a share which would be sufficient to cover the cost of his own maintenance.

If the answer is 'yes', he is 'self-supporting' if the answer is 'no', he is an 'earning dependent'.

The considerations are exactly the same whether the individual is a male or a female, and adult or a non-adult.

(7) CENSUS QUESTION 9 (2):

Question.—Are doctors and lawyers, who employ compounders and clerks independent workers or employers?

Answer.—They are employers. A doctor employs a compounder in order to relieve him of part of the work connected with the business on which he is engaged and by which he secures his livelihood. A lawyer employs a clerk for a like purpose.

Question.—A money-lender employs four persons to realise interest. Is he an employer or independent worker?

Answer.—He is an employer. He would be an employer even if he employed only one person provided that person was regularly employed and derived his principal means of livelihood by such employment. Casual employment, or part-time employment which does not provide the principal means of livelihood of the person employed, should not be taken into account.

Question.—What is the status of tenants or zamindars who do not cultivate (land) themselves, but employ labourers*?

Answer.—If they employ others they are 'employers'—provided the purpose of the employed and the nature of the employment are as stated in the answers to the two preceding questions.

Question.—What is the status of beggars; orphans in orphanages; convicts in jails?

Answer.—They fall in none of the three categories. Record 'o' for them.

(8) CENSUS QUESTION 10:

Question.—What is the category of a minor, a blind person or a lady who has land in his or her name but gets it cultivated by labourers. Category I or Category IV?

Answer.—Learn to distinguish between 'cultivation of the land' and 'performance of labour'.

*In the end the data regarding employment status were tabulated for self-supporting persons of non-agricultural classes only.

necessary for cultivating the land'. There are, of course, millions of persons who perform both functions—but the functions are distinguishable and should be distinguished. *The man who takes the responsible decisions which constitute the direction of the process of cultivation (e.g., when and where to plough, when and what to sow, where and when to reap and so on), it is this person who should be referred to as the cultivator, even though he does not perform any manual labour whatever. The man who ploughs, or sows, or reaps under the directions of someone else is not the cultivator—but a cultivating labourer, a different thing altogether.*

The cultivator may be the owner of the land cultivated. In that case he is category I, whether or not he also combines in himself the functions of a cultivating labourer.

Alternatively, the cultivator may be a lessee, an agent or manager (paid or unpaid). Even in this case it is immaterial whether this lessee or agent or manager also combines in himself, the functions of a cultivating labourer; he (the cultivator) is category II, and the other person (the owner) is category IV.

Applying these principles, the answer to the question put depends on whether the minor, blind person, or lady does or does not actually direct the process of cultivation. If the person does this, the answer is category I, otherwise the answer is category IV.

(9) 1951 CENSUS — ECONOMIC TABLES

On the basis of replies to questions 9, 10 and 11, the people have been divided into two broad livelihood categories, viz., the 'agricultural classes' and the 'non-agricultural classes'.

There are four 'agricultural classes', defined as below :

- I—Cultivators of land, wholly or mainly owned, and their dependants,
- II—Cultivators of land, wholly or mainly unowned, and their dependants,
- III—Cultivating labourers, and their dependants, and
- IV—Non-cultivating owners of land, agricultural rent-receivers, and their dependants

There are four 'non-agricultural classes' defined as comprising all persons (including dependants) who derive their principal means of livelihood from —

- V—Production (other than cultivation);
- VI—Commerce,
- VII—Transport;
- VIII—Other services and miscellaneous sources

Livelihood sub-classes—Each of the 8 livelihood classes have been divided into three sub-classes with reference to their household economic status as below—

- (i) Self-supporting persons,
- (ii) Non-earning dependants, and
- (iii) Earning dependants

Figures for livelihood categories and classes have been compiled. These are being printed and published in District Census Handbooks—one for each district. Figures for livelihood categories, classes, and sub-classes have been compiled for different 'tracts' within every district—'rural tracts' and 'urban tracts' being kept distinct. At this stage, the figures relating to self-supporting persons of non-agricultural classes in every tract are further broken down under 10 divisions and 88 sub-divisions of industries and services and cross-divided into 'employers', 'employees' and 'independent workers'. All these figures are compiled for district divisions, states, zones and all-India—care being taken to furnish separate figures for the rural population and urban population of every territorial unit. All these statistics are printed as 'Economic Tables' in state census reports for the state concerned, its divisions and districts and in the India volumes; for India, zones, states and natural divisions.

II — THE CONCEPT OF 'HOUSEHOLD ECONOMIC STATUS' AT SUCCESSIVE CENSUSES

(10) 1881 CENSUS :

The aim at this census was very simple. It was to record the numbers of 'actual workers'

and to classify them according to 'occupations'. The instructions visualize 'actual workers' as being only such persons as "actually do work and contribute to the family income". The instructions went on to explain that "boys at schools, small children and women who perform no regular work were not to be shown at all in the column of actual workers". "Mere employment in such domestic occupations as spinning will not entitle women to be shown in this column unless the produce of their labour is regularly brought to market". It was visualized that an 'actual worker' might have more than one occupation, as where he "combines agriculture with any other profession or trade such as that of vaki, money-lender, carpenter or smith". In such cases both 'occupations' were to be shown.

(11) 1891 CENSUS.

At this census the title underwent a change from mere 'occupation' to 'occupation or means of subsistence'. This change introduced for the first time the concept of classifying every individual without exception with reference to the sector and sub-sector of the national economic life from which he drew sustenance. In consequence, the question was not limited to the 'actual worker' as in 1881, but addressed to everybody. The 'means of subsistence' were recorded for everybody. One consequence of this change was that the distinction which was implicit in the 1881 Census between 'actual workers' and others was lost. What was the 'occupation' for the actual worker was both 'occupation' and 'means of subsistence' for him, while it was only the 'means of subsistence' for the members of his household who depended on him for their means of subsistence. Hence the alternative form of the title 'occupation or means of subsistence'.

(12) THE NEXT THREE CENSUSES (1901, 1911 & 1921):

At the 1901 Census, it was realised that while it was necessary to get the information obtained at the 1891 Census, it was also necessary to get the information obtained at the 1881 Census, which was lost in 1891. How many people actually worked in each sector or sub-sector of the national life was at least as important information as how many people in all subsisted on it. It was decided that both types of information

should be collected. Accordingly the 'census schedule' was provided with three separate columns (9, 10 & 11) which were headed thus.

Occupation or means of subsistence of actual workers		Means of subsistence of dependents on actual workers
Principal	Subsidiary	
9	10	11

It was explained that the category of 'actual workers' was intended to cover not only all people who worked for their living but also those people who were in receipt of an income without working—e.g., rent or income from investment or pensions or annuities. The 'dependents' were to be distinguished from 'actual workers' as consisting of "women, children and the old and infirm who rely on others for their support and whose occupation, if they have any, is not sufficiently important materially to augment the family income". Thus a dichotomy of the people according to household economic status was established in 1901 and it remained unaltered during 1911 and 1921 Censuses. The actual terms of the instructions underwent minor changes and finally stood in 1921 as below:

Column 9—Enter the principal means of livelihood of all persons who actually do work or carry on business whether personally or by means of servants or who live on house-rent, pensions, etc.

Column 10—Enter here any occupation which the actual worker pursues at any time of the year in addition to his principal occupation.

Column 11—For children and women and old or infirm persons, who do not work either personally or by means of servants, enter the principal occupation of the person who supports them. [It may be noted that 'subsistence' had become 'livelihood'. The word 'occupation' was used as a synonym for 'means of livelihood' in the case of actual workers. Dependents had a 'means of livelihood', but not an 'occupation'.]

(13) 1931 CENSUS:

It was at this Census that a tripartite division of the people according to household economic status was first attempted. The 'actual worker', of five preceding Censuses became the 'earner', of the 'dependents', a distinction was made between 'working dependents' who (though dependent) nevertheless worked and had an 'occupation' and others who had no occupation. The last mentioned group may be referred to as

the 'non-working dependents' (though the question-naire and instructions did not use this expression) The new name 'earner' was introduced because 'actual worker' had been regarded as the opposite of the 'dependent' and it was now proposed to recognise some dependents as also being workers (The anomaly involved in including rentiers and pensioners among 'actual workers' was not however removed by the new name 'earner', which was equally inapposite) The term 'actual worker' was used in the 1931 Census Report to mean the sum total of earners and working dependents

(14) 1931 CENSUS.—(continued)

How exactly was the line to be drawn between the 'earner' and the dependent who was to be classified as 'working dependent'? How was the working dependent to be distinguished from other dependents? The answers were settled as follows by instructions

"Only those women and children will be shown as earners who help to augment the family income by permanent and regular work for which a return is obtained in cash or in kind. A woman who looks after her house and cooks the food is not an earner but a dependent. But a woman who habitually collects and sells firewood is thereby adding to the family income and should be shown as an earner. A woman who regularly assists her husband in his work (e.g., wife of a porter who fetches the clay of which he makes the pots) as an all-time assistant should be shown as an earner, but not one who merely renders a little occasional help. A boy who sometimes looks after his father's cattle is a dependent, but one who is a regular cowherd and earns pay as such in cash or in kind should be recorded as such in column 10. It may be assumed as a rough and ready rule that boys and girls over the age of ten who actually do field labour or tend cattle are adding to the income of their family and should therefore be entered in column 10 or 11 according to whether they earn pay or not. Boys at school or college should be entered as dependents. Dependents who assist in the work of the family and contribute to its support without actually earning wages should be shown as dependents in column 9 and under subsidiary occupation in column 11. Thus a woman who keeps house for her husband is a dependent and entered as such in column 9, but has the subsidiary occupation (column 11) of house keeping.* Similarly weaving is often an important subsidiary occupation for women dependent in Burma and Assam and should be entered in column 11 where, it may or may not, have to take the place of house keeping. Only most important subsidiary occupation should be given

Domestic servants must be entered as cook, blunts, etc in column 10 and not column 9 as dependents

*This instruction introduced a radical change in pre-existing concepts. It had been well settled at all previous censuses that 'occupation' meant 'principal occupation' only. The change appears to have been given effect to, even in 1931, only in Madras and Travancore-Cochin, it was done away with in 1941.

Persons temporarily out of employment should be shown as following their previous occupation"

(15) 1931 CENSUS — (continued) :

While, on the one hand, these instructions were designed to yield additional information, not secured at previous Censuses, they also resulted in some loss of information formerly secured. It will be recalled that completeness of economic classification of the people [by affiliating everyone (including dependents) uniquely to some sector or other of the national economic life] was an essential feature of the Indian Census, first introduced in 1891 and continued up to 1921. In 1931, this information was lost. This loss was foreseen and accepted, as may be seen from the following extract from the 1931 Census Report: "Misunderstandings are familiar in the Indian census schedule and were the cause of one of the changes in the form of the schedule made at this census." In 1921 and 1921 enumerators were instructed to return in the case of dependents the "occupation on which dependent", an instruction which always gave rise to much misunderstanding and consequently unsatisfactory results. The abandonment of this instruction means that there can be no final distribution of the dependence of the total population on the various occupations derived from the individual returns. But there is no reason to suppose that an estimate of this distribution cannot be attained from an examination of the returns of earners and working dependents, which will be as satisfactory for practical purposes as the one obtained from the incompletely comprehended and unsatisfactory returns of "occupation on which dependent" obtained on previous occasions, for a change was also involved in the instructions that a dependent might be regarded as having an 'occupation'. The last mentioned consideration was evidently regarded as decisive. The need for securing a distinct count of 'working dependents' was first accepted. It was felt that the effort to secure the new information and also to continue to secure the information which would affiliate the dependents to the means of livelihood of the persons on whom they were dependent might cause such confusion in the minds of enumerators, as to vitiate the answers to all the questions

(16) 1941 CENSUS

At this census, the 1931 Census conception of household economic status, i.e. putting, people

into three groups instead of two was accepted and continued ; but the criteria were modified:

(a) To begin with, the old limitation of the conception of 'occupation' to 'gainful occupation' was restored. The 1931 Census instruction which resulted in the classification of housewives as working dependents in the occupational group 'domestic service' was given up. In order apparently to prevent the possibility of the 'occupation' concept being extended to non-gainful activity and with an eye possibly also to the avoidance of confusion between 'occupational' and 'industrial' classification systems, the very word 'occupation' was dropped. The questionnaire dealt only with 'means of livelihood'

(b) Under the 1931 Census instructions, it was possible for women who took part as actively as men, in agricultural work, to be classified as 'working dependents' on the ground that they were not in receipt of pay, while boys who earned quite small amounts as pay in cash or kind were classed as 'earners'. The criterion was changed in 1941 and the change was reflected in new names. The census questionnaire referred to persons who were 'wholly dependent' and distinguished them from others who were 'partly dependent'. No name was assigned to the third group, but 'earner' was dropped. A person was 'wholly dependent' if he had "no income in cash or kind". On the other hand, one who "contributes in cash or kind towards the support of the household without being definitely capable of supporting himself" is partly dependent.

(17) 1941 CENSUS — (continued)

It was clear from these instructions that if a dependent was in receipt of pay, either in cash or in kind, he (or she) was not automatically to be taken out of the category of dependents, but the test of adequacy for self-support was to be applied. What was to be the position of 'unpaid family helpers' more particularly women who take part actively in the cultivation of the family holding but receive no pay in cash or in kind? Were they to be treated as 'wholly dependent' since, by hypothesis, they had "no income in cash or kind"; or were they to be deemed to be contributing in cash or kind and classified on that basis?

The issue was settled in different ways by local instructions. But the fact that it gave trouble is evident from the following extracts from the correspondence which passed between the

Superintendent of Census Operations, Sind, and the Census Commissioner.

EXTRACT FROM THE LETTER OF THE SUPERINTENDENT OF CENSUS OPERATIONS, SIND DATED THE 25TH OCTOBER, 1940 TO THE CENSUS COMMISSIONER FOR INDIA

"I noticed one rather interesting error, which was due partly to the Collector having issued orders which seem to me contrary to the spirit of the instructions. I am confident that my view is right but it is of very considerable general importance.

THIS is in regard to question 9. In the Instructions to Enumerators which are attached to your printed General Scheme for the Census Part II, the general definition of "partly dependent" is "A person who contributes in cash or kind towards the support of the household without being definitely capable of 'supporting himself'" "is partly dependent"

One concrete case, out of many observed, was this. The head of a joint family owns a piece of land. He is aged 60 or more. Recorded as zamindar, cultivating himself. He has four adult sons, aged 25, 22, 20 and 19.

These were put down as *totally dependent*: Presumably because the land stood in their father's name and they cultivated it under his directions, contributing nothing but labour.

But these four able-bodied men are obviously quite capable of supporting themselves. If they chose to work as agricultural labourers on somebody else's land, they would naturally be shown as independent. Why then, should the circumstance of their having a father alive, render them "totally dependent", as if they were feeble, blind, insane, or otherwise incapable of supporting themselves?

I feel that in dealing with the agricultural population, the general assumption should be that all able-bodied young men of 18 and upwards are capable of making their own living. The circumstance of their working on their father's land seems to me to have no more the effect of "dependence", than working in a family firm should have on a young solicitor.

I hope my view is correct. Perhaps I have laboured the point unnecessarily, but considering the vast number of people in India engaged in agriculture, the effect of showing thousands of able-bodied men as totally dependent on some other agriculturist, through the mere accident of family relationship, would be devastating. . . .

EXTRACT FROM THE LETTER FROM THE CENSUS COMMISSIONER FOR INDIA DATED THE 1ST NOVEMBER, 1940 TO THE SUPERINTENDENT OF CENSUS OPERATIONS, SIND

"I always knew that our excursions into partial dependency etc., would produce a heavy crop of conundrums and so was not surprised at the emergence of such a one as that brought up in your letter about the Zamindar and his four sons. In census work, however, one has to expect conundrums as a kind of natural phenomenon.

On the actual case, I think it is clear enough that the four men were supporting themselves by labour but I rather hesitate to take your general assumption as stated. Able-bodied young men are no doubt all capable of making

their own living but our census question is "do they in fact do so? Not all able-bodied young men use their able bodies. You might have for example a zamindar's sons who have been to college and do not work on the land or at all and yet are as able-bodied as anybody else. I think therefore your instruction should rather be couched in the form that partial or complete dependency is a matter of fact in each case, to be settled by the enumerator, where doubt exists, on common sense lines. Thus the four men working on their father's farm and carrying through its operations were clearly earning their living and therefore not dependent. Census officers should be reminded that the definition of partial dependence or independence says nothing about actual specific remuneration."

(18) 1941 CENSUS—(contd) :

It will be recalled that the 1931 Census had departed from all earlier censuses since 1891 in failing to affiliate dependents, (through persons on whom they were dependent) to the branch of national economic life from which they derived their means of livelihood. The 1941 Census restored the previous practice in this respect. Thus, the information necessary for affiliating all persons without exception to the appropriate branch of the national economy was secured in addition to the three-fold classification of each individual with reference to his household economic status. [Unfortunately, the results of these enquiries of the 1941 Census were not completely tabulated. Full tabulation was attempted in a few states at that time. Very recently, a two per cent sample of the 1941 Census slips were tabulated for most of the other states. It has not yet been possible to study them from the point of view of behaviour of the sample; nor has it been found possible to put the results together on an all-India basis, in relation to the new territorial limits of states and districts.]

(19) 1951 CENSUS.

The questionnaire and instructions of the 1951 Census were finalised after a discussion in conference with the census superintendents of all states. The following is an extract from the summary of proceedings of that Conference :

"The Conference realised that Questions 9, 10 and 11 of the draft revise were inter-dependent; that these questions were bound to give difficulty, but the difficulty must be faced in view of the importance of securing economic data. After discussion, it was agreed as a preliminary issue that the classification of every person in one or other of three

categories, viz., 'self-supporting', 'earning dependents', and 'non-earning dependents' should be made.

The question of definition was then taken up. Who was a non-earning dependent was clear enough. There was prolonged discussion on the criterion which should distinguish the 'self-supporting person' from the 'earning dependent'. Three suggestions emerged :

First,—that member of the family who earned or received the largest income should be treated as self-supporting and all others should be treated as earning dependents.

Secondly,—the test should be whether a member of a family would be able to maintain himself as well as those persons who would be necessarily dependent on him, in the event of his separation from the family. If the answer is in the affirmative, then the person is 'self-supporting'. Otherwise he is an 'earning dependent'.

Thirdly,—the test is whether the actual cost of maintaining any particular person was or was not fully covered by his income. If it was, he should be regarded as 'self-supporting'. If it was not, he should be regarded as an 'earning dependent'.

A suggestion was made that, in view of the difficulty of definition, the categories may be reduced to two and everybody classified as either 'earning' or 'non-earning'. It was decided* that this suggestion offered no way out, and it would present a more misleading picture of the resources of the people than a three-category classification, however imperfect the definition.

* The point may be explained as below :—An intermediate group which is gainfully occupied and yet not self-supporting does exist. It is significant in size in all parts of the country. It does not bear a uniform proportion in all parts of the country, either to the self-supporting group or to the dependent group. If it was allowed to be allocated to one or other of the two main groups according to the discretion of enumerators without any definite criteria, the resulting figures would be non-comparable as between different parts of the country. If the intermediate group were to be merged in the self-supporting group everywhere, the resulting figures would be formally comparable, but they would present a distorted and consequently misleading picture of the extent to which gainful employment is provided by different sectors of the national economic life. If the intermediate group were to be merged in the 'dependent' group then all the conceptual difficulties of drawing a line between self-supporting and earning dependents must necessarily be faced and overcome. If they are faced and overcome, we might just as well have the full information in three groups, rather than two.

Finally,—the three criteria were put to vote with the following results :—

Criterion No. I • 4 in favour

Criterion No. II • 4 in favour

Criterion No. III • 7 in favour

The Conference decided to accept Criterion No. III. The Chairman suggested that the requisite definition should be framed by a sub-committee with suitable illustrations [Note—A sub-committee was appointed, but it could not produce the definitions and illustrations before the Conference ended.]”

The questions and instructions as finally issued, have been reproduced in Section I

(20) *Plans of Comparison between the 1931 Census and the 1951 Census :*

From what has been said above, the following equations may be regarded as establishing the basis of comparison of the concepts of the 1951 Census and the 1931 Census :—

III—AGRICULTURAL CLASSES—DEFINITIONS AND CLASSIFICATIONS

(21) The ‘Scheme of Occupations’ of the 1931 Census classified ‘occupation’ (then deemed to be synonymous with ‘means of livelihood of earners’) was as follows :

First,—there was a broad division of the national economic life into four classes : A Production of Raw Materials, B Preparation and Supply of Material Substances, C Public Administration and Liberal Arts and D Miscellaneous. The four ‘classes’ were divided into twelve ‘sub-classes’ as below .

A—Production of Raw Materials		B—Preparation and Supply of Material Substances		C—Public Administration and Liberal Arts		D—Miscellaneous	
I Exploitation of Animals and Vegetation	III Industry	VI Public Force	IX Persons living on their means				
II Exploitation of Minerals	IV Transport	VII Public Administration	X Domestic service				
	V Trade	VIII Professions and Liberal Arts	XI Insufficiently described occupations				
			XII Unproductive				

These twelve ‘sub-classes’ were divided into 55 ‘orders’, and further sub-divided into 195 ‘occupational groups’. The first two of the 55 orders were—‘Pasture and Agriculture’ and ‘Fishing and Hunting’. They were parts of sub-class I—‘Exploitation of Animals and Vegetation’. Within the ‘order’ called ‘Pasture and Agriculture’, there were 16 occupational groups, which constituted ‘agriculture’ in a broad sense so as to include not only ordinary cultivation of field crops, but also horticulture, plantation industry, animal husbandry and forestry. Eight out of these groups were however distinguished as sub-order I (a) and termed ‘agriculture proper’, this being strictly limited to ordinary cultivation of field crops.

(22) In view of the overwhelming importance (numerical and otherwise) of ‘agriculture proper’ as thus defined it has been isolated at this census as a distinct livelihood category. All the people who derive their principal means of livelihood from ‘agriculture proper’ are referred to as the ‘agricultural classes’ including not merely

those who cultivate the land or perform labour on cultivation, but also others who are dependent on such persons for their subsistence. All those who do not belong to the 'agricultural classes' are known as the 'non-agricultural classes'. The agricultural classes have been divided into four separate 'livelihood classes' at the 1951 census and are shown below side by side with the eight occupational groups of the 1931 census.

<i>Occupational groups of 1931 Census</i>	<i>Agricultural livelihood classes of 1951 Census</i>
[Under sub-order I (a)]	
1. Non-cultivating proprietors taking rent in money or kind	I Cultivators of land <i>wholly or mainly owned</i> and their dependants
2. Estate agents and Managers of owners.	II Cultivators of land <i>wholly or mainly uncultivated</i> and their dependants
3. Estate agents and managers of Government	III Cultivating labourers and their dependants
4. Rent collectors, clerks, etc.	IV Non-cultivating owners of land, agricultural rent receivers and their dependants

- 5 Cultivating owners
- 6 Tenant cultivators
- 7 Agricultural labourers
- 8 Cultivators of *Jhum*, *taungya* and shifting areas

The equation between the 'groups' of 1931 and the 'classes' of 1951 must be made with very great care if incorrect and misleading inferences are to be avoided.

23 By far the most important among the occupational groups of 1931 are No 5—cultivating owners and No 6—tenant cultivators. It may seem to be natural and self evident that the 'cultivating owners' of 1931 should be identical with Livelihood Class I of 1951, and the 'tenant cultivators' of 1931 should be identical with Livelihood Class II of 1951. Actually this is not the case, and it is very necessary that users of census statistics should understand why they are not identical. The following extract from the 1931 Census report will show how the line of demarcation between 'cultivating owners' and 'tenant cultivators' was intended to be drawn.

"A difficulty of definition was also raised by the term 'cultivating owners'. Freehold tenures, as understood in Britain, are conspicuous by their absence in India

generally, and the variety of tenancies and sub-tenancies is legion. A census definition of ownership was found unexpectedly difficult to frame in any simple manner which would be consistent in most provinces, and ultimately ownership was defined as the possession of rights of occupancy, a term which covered all cultivators holding on a lease from Government as well as many others with a conditional or preferential right to their holdings subject to periodic reassessment of rents."

The intention thus expressed was not, however, given effect to consistently.

24. The truth is that a great deal of confusion is caused by the prevalence of different names in different parts of the country which stand for substantially identical tenures and also the prevalence of the same names for tenures which are substantially different. This may be illustrated by the following table which shows the different classes of persons holding land (under different names) in Uttar Pradesh, Bihar and Madhya Pradesh.

UTTAR PRADESH

	<i>Area in millions of acres</i>
A. 'Sir' and 'khudkashi'	5 96
B (1) Hereditary tenants	14 99
(2) Occupancy tenants	10 41
(3) Ex-proprietary tenants and holders of special tenures in Oudh.	0 82
(4) Fixed-rate tenants and permanent tenure holders	0 71
	26 92
C Non-occupancy tenants	0 19
TOTAL	33 07

BIHAR

A (1) Held by proprietors (including <i>zirat</i> and <i>bakshi</i>)	2*12
(2) Held by tenure holders in cultivating possession	1 34
	3 46
B (1) Occupancy-rayats other than those paying produce-rents	16 58
(2) Occupancy-rayats paying produce-rents	2 33
(3) Rent-free holders	0 96
(4) Rayats holding at fixed rents or rates	0 49
	20 36

G. (1) Non-occupancy-rayats	0 33
(2) Under-rayats	0 33
Total	0 66
TOTAL (A, B, and C)	24 48
Un-occupied	4 25
GRAND TOTAL	28 73

MADHYA PRADESH

A Held by malguzars ('Sir' and 'khud-kash')	3 87
B Held by mahk-mahbuzas	0 85
C Held by absolute occupancy tenants	2 10
D Held rent-free subject to rendering village services	0 18
Total	7 00
E Held by rayats in rayatswan village - In the Central Provinces	1 28
In Berar	8 30
Grand Total	16 58

In Bihar, the people who hold lands of the four types classed B are called 'rayats'. Were they the 'owners' of the land they hold or were the zamindars or other 'proprietors' of the estates in which the land was situated to be called the 'owners' of such lands? The answer to this question—whichever way it went—would make a great difference to the statistics of 'cultivating owners' and 'tenant cultivators'. Now, these Bihar rayats have (and they have had for a very long time) exactly the same rights in those lands as the persons called 'rayats' in Bombay and Madras. They paid 'rent' to zamindars while their name sakes in Bombay and Madras paid 'land revenue' to the Government. The 'rent' they paid was not *necessary* more onerous than the 'land revenue' in Bombay or Madras; not infrequently they were less onerous. More important, the zamindar was *disentitled* to enter on and cultivate the land; that right vested in the 'rayat'. It would be a curious kind of 'ownership' of agricultural land, which did not carry with it the right to enter on and cultivate the land. Therefore, the zamindar in Bihar no more 'owned' the land held by a 'rayat' than the Government did in Bombay and Madras. He 'owned' the estate, he might also 'own' some plots of land in the estate, but certainly did not own those lands in the estate which were held by rayats. From the point of view of rational economic

classification, the rayats of Bihar should be classed with the rayats of Bombay and Madras, though in popular parlance the former had (and the latter did not have) a 'landlord'. It is clear from the extract from the 1931 Census Report that the intention was to bring about such a rationalisation of classification. But the Census of India (being a temporary organisation hastily put together on an *ad hoc* basis once every ten years) always works under great handicaps and this excellent intention was not understood and given effect to uniformly.

The people who held lands in Uttar Pradesh (of any of the four type classed B) were, in all essential respects, in exactly the same position as the rayats of Bihar. So also the people who held lands of type C in Madhya Pradesh. But the local land laws referred to them as 'tenants'. Were they to be classified, therefore, as 'tenant cultivators' or 'cultivating owners'? Uttar Pradesh classified them as 'Tenant cultivators' while Madhya Pradesh classified them as 'cultivating owners'. The intention of the Census Commissioner was thus defeated.

25 At this census it was decided that a concerted effort should be made to make sure that the intention was correctly carried out. The following is a relevant extract from the proceedings of the First Census Conference:

"The agricultural means of livelihood for which contractions have been indicated in the questionnaire were then taken up. There was discussion as to the exact scope of the various terms used.

It was agreed that the term 'ownership' should be used so as to cover every case where a person had a permanent right of occupancy in the land. It was not essential that this right should include the right of unrestricted transfer. But it should be a heritable right. It was further agreed that each Superintendent should include in his booklet of instructions, certain illustrations specifying the tenures by their local names and explaining that they are included in the term 'ownership'."

26 Occupational Group 7 of 1931, which stands next in importance, is identical with Livelihood Class III of 1951. There is no conceptual distinction between the 'agricultural

labourer' of 1931 and the 'cultivating labourer' of 1951. [But there is a complication arising from the treatment of 'dependents' which will be explained presently]

27 The Occupational Group I of 1931 is identical with Livelihood Class IV. It should be noted that this includes two quite different types of people who are lumped together in popular parlance as 'landlords' but who do not have the same rights in land. First, there are the 'Zamindars' and other proprietors of 'estates' who receive rent from land in these estates. As explained already such land is not 'owned' by them. Such persons are 'agricultural rent-receivers', falling within Livelihood Class IV, unless they also 'owned' land of the type classed as A in Uttar Pradesh (vide para 18 above) and the income from such lands was more important than the rent on lands of type B. There is another type of people also included in Livelihood Class IV. They are to be found among the people who really 'own' the land—e.g., the raiyats of Bihar, Bombay or Madras, or the occupancy tenants of Uttar Pradesh or the absolute occupancy tenants of Madhya Pradesh, or the excepted types of zamindars and other 'proprietors' of estates referred to above.

If these 'owners' entrusted the responsibility of cultivation to others on a temporary basis, they would be included as 'non-cultivating owners of land' in Livelihood Class IV.

28 There is a very important question as to what is and what is not involved in 'cultivating' the land. One hears very often about the 'tillers of the soil'. Who are they? Is it possible for a person to 'cultivate' the land without performing manual labour? Is a wage-labourer employed by a 'cultivating owner' or tenant cultivator also a 'cultivator'? There had to be a clear cut definition of the term. This was all the more necessary because it was known that in some areas some categories of tenants-at-will or other contractual non-occupancy tenants were returned and classified as 'agricultural labourers', mainly for the reason that they were locally indistinguishable from permanent farm servants and partly in order to avoid giving rise to claims of occupancy right. Hence the special instructions (vide para 10 section I) explaining and emphasising the conceptual distinction between the 'cultivator' (who might be either of Live-

hood Classes I or II) from the 'cultivating labourer' (Livelihood Class III) on the one hand and the 'non-cultivating owner' (Livelihood Class IV) on the other.

29 The persons included in the 1931 Occupational Groups 2, 3 and 4 (Estate agents or managers, rent collectors, etc.) are insignificant in number. At this census, they were excluded from the agricultural classes altogether and treated as non-agricultural. The distinction implied in 1931 occupational group 8 between 'shifting' cultivation in certain forest areas and ordinary cultivation in settled villages was given up, and this group became merged in Livelihood Class I.

30 One other distinction must be mentioned between the 1931 system and 1951 system of classification of people supported by agriculture. It will be recalled that in 1931 (unlike earlier as well as later censuses) classification was limited to the 'earner' and the 'working dependent', the 'non-working dependent' not being classified at all. In the 1951 Census, all the people, including dependents, have been classified. This gives rise to two differences,

First,—Either the non-earning dependent must be excluded from the 1951 totals, or an estimate for non-working dependents included in the 1931 totals before the two sets of figures may be compared, and

Secondly,—The basis of classification of the working dependent in 1931 was 'occupational'. The significance of this fact is thus explained in the 1931 Census Report. "In 1931, it must be remembered, the working dependents of cultivating owners and tenant cultivators have appeared as dependent workers in the category of agricultural labour; and the proportions, therefore, of agricultural labourers to cultivators is inflated by these figures". These observations were made in the context of a sharp increase in 1931 of the percentage of 'agricultural labourers' in 1931 as compared with 1921, and have equal significance in the present context of a sharp diminution in 1951 of the percentage of the same class.

The treatment of earning dependents at this census is different. Let us suppose that the son of a cultivating owner earns an income by employment as cultivating labourer, but this income is not sufficient for his upkeep. He is then an earning dependent. He is classified as belonging to the 'earning dependent' sub-class of Livelihood Class I—his father's class. If his own means of livelihood, had been sufficient for self-support he would have been classified as a self-supporting person of Livelihood Class III. But, since the boy's employment is not self-supporting, the nature of his employment is relevant only to the classification of 'secondary means of livelihood', and is used for that purpose. But the basic classification of the people into livelihood categories—classes and sub-classes—is based entirely on the 'principal means of livelihood of self-supporting person' only, all dependents (earning and non-earning) being affiliated to appropriate sectors of the national economic life through the self-supporting persons on whom they were dependent.

31 To sum up, the establishment of comparisons between the 1951 Census and the 1931 Census requires much discrimination. In particular, allowance should be made for the unknown number X referred to in equations II and III of para 20 Section II, and it should be remembered that there is some difference between the earners of 1931 and the corresponding self-supporting persons of 1951. Subject to this specific reservation the following equations are conceptually valid.

I—Self-supporting persons of Livelihood Class I to IV of 1951=Earners of 1931 Occupational Groups 1, 5, 6, 7 and 8

II—Self-supporting persons of Livelihood Class I of 1951=Earners of 1931 Occupational Groups 5 and 8 plus those earners of 1931 Occupational Group 6 who (as in Uttar Pradesh) were classed as 'tenant cultivators', even though they had a heritable right of occupancy in the land which they cultivated.

III—Self-supporting persons of Livelihood Class II of 1951=Earners of 1931 Occupational Group 6 minus those among them who (as in Uttar Pradesh) were classed as 'tenant cultivators', even though they had a heritable right of occupancy in the land they cultivated.

IV—Self-supporting persons of Livelihood Class III of 1951=Earners of 1931 Occupational Group 7

V—Self-supporting persons of Livelihood Class IV of 1951=Earners of 1931 Occupational Group I

VI—It is not to be expected that the numbers of 'earning dependents' of 1951, appearing as sub-classes in each of the four livelihood classes, will correspond to the 'working dependents' of the corresponding 1931 occupational groups, even after allowance is made for the unknown number X (vide para 24 section III). But such correspondence is to be expected between the 1931 classification of 'working dependents' and the 1951 classification of 'secondary means of livelihood of earning dependents'.

V—NON AGRICULTURAL CLASSES—DEFINITIONS AND CLASSIFICATIONS

32 The Classification Scheme of Classes, Sub Classes Orders and Groups referred to in para 23 section III, was first adopted by the Census of India in 1911. It was based on a system devised by Dr JACQUES BERTILON and approved by the International Statistical Institute. Variations were made from census to census, in the number and scope of occupational groups, but the system as a whole and the identity of larger units remained unchanged.

33 Recently the Statistical Organisation of the United Nations evolved a Scheme of Classification known as the 'International Standard Industrial Classification Scheme'. The Economic and Social Council of the United Nations recommended the use of this Scheme by all Member Governments "either by adopting the system of classification as a national standard, or by re-arranging their statistical data in accordance with that System for purposes of international

comparability.³⁴ The latter of these two courses has been followed at this Census.

All Industries and Services (other than cultivation) which, as explained already is treated as a category by itself, are divided into ten divisions, viz.,

- (0) Primary Industries not elsewhere specified,
- (1) Mining and quarrying ;
- (2) Processing and Manufacture—foodstuffs, textiles, leather and products thereof ,
- (3) Processing and Manufacture—metals, chemicals and products thereof ,
- (4) Processing and Manufacture not elsewhere specified ,
- (5) Construction and Utilities ,
- (6) Commerce ,
- (7) Transport, Storage and Communications ,
- (8) Health, Education and Public Administration , and
- (9) Services not elsewhere specified.

These ten divisions have been sub-divided into 88 sub-divisions. The details will be found in the Indian Census Economic Classification Scheme papers which are printed along with the Economic Tables (Part II-B and Part II-C). It is sufficient to observe that statements have been furnished with the help of which it is possible to relate these 'divisions' and 'sub-divisions', on the one hand, to corresponding 'orders' and 'groups' of 1931, and, on the other hand, also to the 'divisions' and 'major groups' of the International Standard Industrial Classification Scheme.

34 Comparability of the frame-work of classification has thus been established. Thus, however, is not enough. It is necessary to secure that the principles adopted for fitting individuals within this frame-work should also be the same. In the first place there is a technical distinction (somewhat confusing to the lay reader) between the 'Industrial' classification and the 'occupational' classification of all gainfully occupied persons. Thus, are all drivers of motor vehicles to be added together and shown under one head, or the drivers of motor vehicles employed by a factory added to other persons employed by such factory and shown under a head which exhibits the commodities produced by such fac-

tory. The answer indicates the distinction between the 'occupational' and 'industrial' classification. Even when the latter is definitely chosen, there is a further difficulty about the employing unit, whose production is to be the basis of classification. This may be an 'establishment', or it may be an 'enterprise' of which the 'establishment', is a part. The latter was the recommended basis of International Standard Industrial Classification Scheme.

35 The main principles of classification adopted in the Census of India were thus described in 1911 :

"(1) Where a person both makes and sells, he is classed under the industrial head, the commercial one is reserved for persons engaged in trade pure and simple. On the same principle, when a person extracts some substance, such as saltpetre, from the ground and also refines it, he is shown under the mining and not under the industrial head.

(2) Industrial and trading occupations are divided into two main categories :—

(a) those where the occupation is classified according to the material of which the articles are made, and

(b) those where it is classified according to the use which they serve. As a general rule, the first category is reserved for the manufacture or sale of articles the use of which is not finally determined, but it also includes that of specified articles for which there is no separate head and also the occupations, so common in India, which are characterized by the material used rather than the particular articles made. The ordinary village *moohi*, for instance, makes not only shoes, but also waterbags and all other articles of leather, which he tans himself.

(3) As a general rule, when a man's personal occupation is one which involves special training, e.g., that of a doctor, engineer, surveyor, etc., he is classed under the head reserved for that occupation, irrespective of the agency by which he is employed. A ship's doctor, for instance, is shown as a doctor and not as a ship's officer. An exception is made in cases where the work in which an individual is employed involves further specialization e.g., that of a marine or sanitary engineer. Only those Government servants are shown in sub-class VII who are engaged in the general administrations. Officers of the medical, irrigation, opium, post office and other similar services are classed under the special heads provided for these occupations."

36 The system is similar to that now recommended for purposes of international comparability in that it is based on the principle of 'industrial' classification and not what is technically called 'occupational' classification. But the application of the principle is based, however, not on 'establishments' or 'enterprises'.

but on the individual, who is classified. It is on this basis and not on an 'establishment' basis that the 1951 Census data (like all similar data of all earlier censuses) have been tabulated. The following extracts from the papers relating to the I C E C Scheme explain the decision.

"2. *Unit of Classification*—Under the I S I C Scheme, the unit of classification is the organised 'establishment'. The commodity produced or the service performed as a result of the work of the organised establishment is the criterion for classifying the establishment. The classification of the establishments is the classification of every member of the establishment.

Under the present (I C E C) Scheme the unit of classification is, in every case, the individual. All employers and all independent workers will be classified with reference to the commodity produced or service performed by them individually—this will be same as in the I S I C Scheme there being no question of an 'establishment' distinct from the individual in these cases.

As regards 'employees', all persons engaged in production, commerce or transport (and not being domestic servants) will be classified under the appropriate sub-divisions with reference to their own activity, and without reference to that of their employer. Domestic servants will all be classed in one sub-division without reference to the nature of their work. All other employees (including all managerial and supervisory employees, clerical services, messengers, watchmen and unskilled labour of every description) will be classified with reference to the commodity produced or service rendered by their employers*.

Thus, there is a technical distinction regarding the unit of classification adopted in the two Schemes. This is unavoidable having regard to the nature of the questions which alone can be put in a general population census in India. Nevertheless, there will be no difference between the two Schemes, except as

regard the allocation of those 'employees' who are individually engaged in activities classifiable as production, commerce or transport, and who are employed in 'establishments' whose main purpose is classifiable differently from the activity of the individual employee.* The Proportion of employees of this kind to the total of all active workers in industries and services (as they are organised at present in India) is unlikely to be large enough to make a significant difference to the comparability of data classified under the two Schemes.

"3. *Economic Tables (B Series)*—The Committee gave careful consideration to the conceptual basis of the Indian Census Economic Classification Scheme, in relation to that underlying "industrial" and "occupational" classifications as evolved by international agencies; and came to the following conclusions.

The framework of classification of economic activities under the International Standard Industrial Classification Scheme was relatable to that of the Indian Census Economic Classification Scheme in the manner explained... The differences call for no comment, except that the latter scheme is designed to give a picture of how the people of India actually obtain their means of livelihood and it is, therefore, closer to the actual shape of the economic structure of the country than the international scheme. In order to achieve exact comparability, it is necessary not only that the framework should be relatable, but the basis of fitting the individual within the framework should be the same. The Committee observes that such identity does not exist. This fact is stated in Appendix VI of Memorandum No II, where a precise description is given of the nature and scope of the differences between the two schemes. The Com-

* When this scheme was finalised, the intention was to apply an "industrial" classification to technically specialised employees as well. There are some reasons to think that this intention might not have been consistently given effect to in all States. But the numbers involved are likely to be small.

† Population Advisory Committee set up by Government of India to advise the Registrar General on technical matters.

mittee discussed this difference fully and formed the opinion

First,— that the nature of the information procurable in a general population census is such that an exact classification on an "industrial establishment" basis is not feasible and, therefore, the difference is unavoidable, and

Secondly,— as stated in Appendix VI, the numbers of persons in respect of whom the difference in the conceptual basis of classification is significant are likely to be relatively small in India, under present conditions of organisation of industrial establishments

The Committee accordingly approved the scheme as framed and placed on record the following observations :

(i) There is a considerable volume of non-census data available in the form of statutory returns from factories, companies, etc. They provide material which could be drawn upon, where necessary, for labour force statistics classified on "industrial establishment" basis in so far as this might differ from the census economic classification.

(ii) There is provision in para 5 of Memorandum No I for 'occupational Abstracts' for local areas within every district, based on replies to census question 10. The Committee hopes that when these become available, they could be studied with a view to ascertaining how far they provide material for compilation on an 'occupational' basis, in so far as this might differ from the census economic classification.

PART—B

Review of Data relating to House-hold Economic Status

I—The 1951 Census picture

(1) Out of 3,569 lakhs, who were counted in the 1951 Census, the economic data relating to 3,566 lakhs were tabulated (those of a little under 3 lakhs in the Punjab have been destroyed by fire). There were 1,832 lakhs of males and 1,734 lakhs of females. They were classified, by household economic Status, as shown below .

TABLE I

	Persons	Males	Females
Self-supporting persons	1,644	872	172
Earning dependents	379	134	245
Non-earning dependents	2,143	826	1,317
Total	3,566	1,832	1,734

Out of 36 crores of people, over 21 crores do not earn anything nor are they in receipt of any unearned income. If to this number those who procure some income but not enough even for their own upkeep be added, the number increases to 25½ crores. The number of people who procure their own means of livelihood in full

and also support others is very nearly 10½ crores. Within this number, roughly five out of six are men, and the sixth is a woman.

(2) The all-India proportions for the three groups regardless of sex—were 29.3 per cent, 10.6 per cent and 60.1 per cent respectively. The following table shows how these proportions varied among the six zones :

TABLE 2

Zones	Percentage to general population of		
	Self-supporting persons	Earning dependents	Non-earning dependents
North India	30.5	12.0	57.5
East India	30.8	6.0	63.2
South India	26.5	4.9	68.6
West India	26.9	13.8	57.3
Central India	29.1	20.0	50.9
North-West India	32.3	12.6	55.1
INDIA	29.3	10.6	60.1

The following points may be noted. The variations in the percentage of self-supporting persons range from about nine-tenths of the all-India average (South India) to about eleven-tenths of the all-India average (North-West India). The percentage of earning dependents varies more widely. It is less than half the all-India average in South India and nearly double that average in Central India. One consideration may be set out and dismissed at this stage. It might seem natural that the differences between the zones should be relatable to the differences in age-structure. The following table shows the relevant figures of age-structure.

TABLE 3

Zones	Percentage to general population		
	Persons under age 15	Persons aged 15-54	Persons aged 55 and over
North India	38.5	53.1	8.4
East India	37.9	53.2	8.9
South India	36.9	54.6	8.5
West India	39.5	53.4	7.1
Central India	38.8	53.5	7.7
North-West India	40.5	51.0	8.5
INDIA	38.4	53.3	8.3

By comparing TABLES 2 and 3, it can be easily seen that the differences in age-structure between one zone and another are quite small and they do not help to explain the much more considerable differences in the classification of people by household economic status.

(3) It is evident that the ratios must be very different for men and women. This difference might not be the same in towns and villages. As the zones vary to some extent in sex-ratio and to a still greater extent in respect of the proportion of urban to rural population, it is necessary that we should work out separate ratios for rural

males, urban males, rural females and urban females separately. Hence the following table.

TABLE 4

	Self-supporting persons	Earning dependents	Non-earning dependents
Rural males	47.1	7.9	45.0
Urban males	49.8	4.6	45.6
Rural females	10.4	16.1	73.5
Urban females	7.4	4.5	88.1

We should now examine whether the ratios for the different zones differ considerably when they are analysed under these four heads separately.

(4) *Rural males*—The figures for 'rural males' are presented below separately.

TABLE 5

Zones	Self-supporting persons	Earning dependents	Non-earning dependents
North India	52.8	6.8	40.4
East India	46.0	6.3	47.7
South India	42.8	4.5	52.7
West India	43.1	10.8	46.1
Central India	48.2	13.6	38.2
North-West India	50.4	10.1	39.5
INDIA	47.1	7.9	45.0

Comparing with TABLE 2 we note the following. The separate ratio for rural males seems to vary among the zones in much the same way as the combined ratio. In both tables, South India stands lowest in self-supporting persons and highest in non-earning dependents, East

India is second highest in non-earning dependents and second lowest in earning dependents, and Central India is lowest in non-earning dependents and highest in earning dependents. The ratios for rural males are higher in North India, North-West India and Central India than in the other three zones—but in what order? The order is, as stated, if the zones are arranged in descending order of self-supporting persons. If they are arranged in descending order of non-earning dependents we get exactly the opposite result. Is this an idiosyncrasy of enumeration or is there any real significance in the order indicated by these figures?

5 Urban males

The table for 'urban males' is given below.

TABLE 6

Zones	Self-supporting persons	Earning dependents	Non-earning dependent
North India	51.7	3.9	44.4
East India	55.0	2.4	42.6
South India	44.6	4.7	50.7
West India	50.9	5.2	43.9
Central India	48.7	6.1	45.2
North-West India	48.9	5.5	45.6
INDIA	49.8	4.6	45.6

South India stands again lowest in self-supporting persons and highest in non-earning dependents. East India has arisen to first place, being highest in self-supporting persons and lowest in non-earning dependents. Somewhat surprisingly, North India gets second highest place, beating West India by a few decimal points, but the position is reversed if the earning dependents are also taken into account in both zones.

The variability between the zones is no wider in self-supporting persons and is noticeably less wide among earning dependents. The relative proportion of earning dependents is, in any event, so small in all zones that the question whether the variations are real or merely reflect idiosyncrasy of enumeration is of little importance.

6 Rural females

The rural females are, in the present context, the most disturbing among the four sets of people. This is seen from the table below.

TABLE 7

Zones	Self-supporting persons	Earning dependents	Non-earning dependents
North India	6.3	20.4	73.3
East India	13.9	6.6	79.5
South India	10.4	5.8	83.8
West India	6.6	29.9	63.5
Central India	9.6	31.3	59.1
North-West India	13.9	19.7	66.4
INDIA	10.4	16.1	73.5

Variations between the zones are obviously large. We saw that a ten per cent margin on either side of the all-India average for self-supporting persons was sufficient to cover the values of all zones in TABLE 2. In this table, we need a forty per cent margin. We had already observed in other tables that the percentage of earning dependents varies more widely than that of self-supporting persons. This feature is reflected in this table also. One fact alone remains unvaried—South India retains, even in this table, the unenviable distinction of having the highest percentage of non-earning dependents among all the Zones.

7. Urban females:

They appear to have the least significance, so far as earning a livelihood is concerned. Here are the figures.

TABLE 8

Zones	Self-supporting persons	Earning dependents	Non-earning dependents
North India	4.9	2.7	92.4
East India	9.5	1.8	88.7
South India	7.9	3.1	89.0
West India	7.3	6.9	85.8
Central India	7.9	8.2	83.9
North-West India	6.1	4.2	89.7
INDIA	7.4	4.5	88.1

For once, South India falls into second place and North India has the smallest percentage of self-supporting persons and highest percentage of non-earning dependents

8 These figures indicating differences between different zones raise a question. How far are they comparable with one another (in which case the differences in percentages must reflect real differences in the extent to which the people are gainfully occupied* in different zones) and how far they arise out of mere idiosyncracies of enumeration (in which case the differences signify nothing)? The question arises prominently in relation to the classification of women. The figures for urban females are, as noted already, so small, in any case, that differences do not matter much. Besides, they look consistent. It is the classification of rural females which calls for careful consideration. In India, as a whole, it appears that rather more than one in four of them (26·5 per cent) take part in earning a livelihood,

either as self-supporting persons or as earning dependents. The proportion varies from as low as about one-sixth in South India to as high as about two-fifths in Central India. The order among zones is as follows: South India (16·2), East India (20·4), North India (26·7), North-West India (33·7), West India (36·5), and Central India (40·9). Is there really as large a variation as these figures indicate between different parts of the country as regards participation of village women in gainful employment—which means, to all intents and purposes, in the cultivation of land? Or could it be that the enumerators of South India and East India have recorded as non-earning dependents women who do as little work in the fields as those whom the enumerators of West India and Central India have recorded as earning dependents?

The same doubt arises also about another aspect of the difference between the zones which is shown in the TABLE 9

TABLE 9

Zones	Percentage of rural females who are either self-supporting persons or earning dependents	Ratio between self-supporting persons and earning dependents among 100 rural females who are either self-supporting persons or earning dependents	
		Self-supporting persons	Earning dependents
North India	26·7	24	76
East India	20·4	68	32
South India	16·2	64	36
West India	36·5	18	82
Central India	40·9	23	77
North-West India	33·7	41	59
INDIA	26·5	39	61

* It will be seen presently that the number of persons who are self-supporting without being gainfully occupied is so small that they can be ignored.

It is interesting to observe that the six zones fall into three pairs, each with a pattern of its own. East India and south India have the smallest ratio of village women who are gainfully occupied—about one in six in one case and one in five in the other. They have also got the smallest ratio of earning dependents among village women. The number classified as self-supporting is about twice as numerous as those classified as earning dependents.

At the other end we have West India and Central India where the largest ratios of gainfully occupied village women are found. The ratio of earning dependents among them is highest—they are three to four times as numerous as the number classified as self-supporting. North India and North-West India fall in an intermediate category between these two extremes.

9 It is by no means improbable that female participation in field labour does vary very considerably. Differences in seasonal conditions, as well as nature of crop raised, may cause significant differences in the extent to which large number of workers are specially mobilised at certain critical stages of cultivation. Given the same degree of need for such mobilisation, some areas have a normally unemployed surplus of male labour which is available and can be drawn upon even in such critical stages; in others the need cannot be met unless large numbers of women lend a helping hand. Where it is possible to choose whether male or female labour should be drawn upon, the social habits and customs of the cultivating classes may, in some areas, encourage the women freely to take part; while, in others, the cultivators would rather incur the expense of hired labour than to see their women folk working in the fields. For all these reasons, it may be regarded as a reasonable presumption, unless the contrary is proved, that the figures do reflect genuine differences in the participation of village women in gainful employment.

Given such differences, it is easy also to understand that, where the percentage of female participation is low, there the ratio of self-supporting women would be high; for, in these areas, it may be assumed that the women take part in work on much the same terms as the men, more or less throughout the cultivation season and not merely at particular stages of cultivation.

One other circumstance which should be mentioned in this context is the consistency which the figures display when subjected to local review. The State Census Reports contain the results of comparison of the figures on a district or divisional basis. It is found that the differences within each state are not very large; and, where they are observed, they do not seem to be arbitrary but intelligibly related to known differences in economic and social conditions between the districts or natural divisions concerned.

10 At the same time, it must not be overlooked that drawing a line between the self-supporting persons and the earning dependents is, by the very nature of census operations, a rough and ready process. The enumerators do not make income-expenditure calculations—they could not have done it even if they had the time, and they had no time. They were, therefore, instructed to accept the word of the head of the household about whether the work done by the individual in question did or did not suffice to earn his keep. The fact that such a criterion was stipulated and its importance emphasised by instructions—written and oral—in all local languages would have no doubt helped to limit the number of doubtful cases. But a fairly wide margin of doubt must nevertheless have existed. Reports make it clear that it did. In such cases, it is likely that their decision depended, as one Superintendent of Census Operations puts it, on how 'patriarchal' the head of the household felt. More often, perhaps, the local census staff evolved their own rules of thumb for the allocation of marginal cases by reference to age, sex and nature of occupation. Therefore, it is not merely possible but probable that the line between the earning dependent and the self-supporting persons was drawn at somewhat different levels in different states and thus a margin of uncertainty regarding significance of differences might have been introduced. It should be added that these difficulties are not so important in drawing the line between the non-earning dependent and the earning dependent and there should be much less uncertainty regarding comparability of figures of non-earning dependents.

On the whole, it is safe to conclude that the differences in the figures for rural females indicate that corresponding differences do in fact exist in respect of the volume and nature of their participation in gainful occupations—but it is

much less safe to accept the differences between different states in these figures as *exactly measuring* the actual difference.

11. At this stage, it is convenient to effect a simplification of this comparison, by introducing a *single yardstick for the measurement of gainful employment which would combine both self-supporting persons and earning dependents on a weighted basis*. We know that an average self-supporting person of India supports himself and at least two others, while an earning dependent, by definition, does not secure enough income to support even one person. On a broad average, therefore, we cannot regard one earning dependent as worth more than one-third of one self-supporting person. If, therefore, we define the 'Male Breadwinner Percentage' of any territory as the percentage of self-supporting persons to the total population of that territory plus one-third of the percentage of earning dependents to the total population, we shall get the yardstick we are seeking. The following table shows the 'Male Breadwinner Percentage' of the six zones of India, defined in this manner.

TABLE 10

Zones	Male Breadwinner Percentage		
	General	Rural	Urban
North India . .	54.7	55.0	53.0
East India . .	49.1	48.1	55.8
South India . .	44.7	44.3	46.1
West India . .	48.7	46.7	52.7
Central India . .	52.4	52.7	50.7
North-West India . .	53.1	55.8	50.7
INDIA . .	50.0	49.7	51.3

12. On the basis of TABLE 10, the following conclusions may be stated.

(i) In India as a whole, the male breadwinner percentage runs out to be the round figure of 50.0 per cent. Male breadwinners are slightly more numerous in towns than in villages in the country as a whole -- the difference being measured by 1.6 per cent.

(ii) It is clearly shown by the figures that the male breadwinner percentage is highest in North India and lowest in South India. One exceeds the India average and the other falls short of the India average by a margin which clearly exceeds 5 per cent. The zones arranged in order of male breadwinner percentage are: North India, North-West India, Central India, East India, West India and South India.

(iii) The foregoing is also the order among the zones if the villages alone are reckoned. If towns alone are reckoned, the order gets changed as follows: East India, North India, West India, North-West India, Central India, and South India. In East India and West India, the male breadwinner percentage is distinctly larger in towns than in villages. South India also reproduces this feature, though less prominently. In the other three zones (North India, North-West India and Central India) the male breadwinner percentage is slightly larger in villages than in towns.

(iv) On almost every kind of reckoning, South India seems to be the last among all the six zones in respect of the prevalence of gainful employment.

II.—Comparison between 1951 and 1931

13. Table II compares the household economic data as ascertained by the 1951 and 1931 Censuses for India and the six zones

TABLE II

(NUMBER IN LAKHS)

Zones	1931				1951			
	Total population	Earn-ers	Work- ing depend- ents	Non- working depend- ents	Total population	Self support- ing persons	Earning depend- ents	Non- earning depend- ents
North India . . .	498	207	34	257	632	193	76	363
East India . . .	700	260	26	414	901	277	54	570
South India . . .	577	214	26	337	756	201	37	518
West India . . .	287	94	22	171	407	109	64	234
Central India . . .	422	169	47	206	523	152	104	267
North-West India . . .	270	91	34	145	350	113	44	193
INDIA	2,754	1,035	189	1,530	3,569	1,045	379	2,145

In constructing this table two adjustments have been made to the figures in published census tables .

(i) Sixty-eight lakhs of women in Madras and Travancore-Cochin who had been classified as working dependents in 1931 under the head 'domestic service' are transferred to and included under the total of 'non-working dependents' of 1931 for South India

(ii) Three lakhs of people in Punjab (whose 1951 Census records were destroyed by fire) have been allocated (1 lakh as 'self-supporting persons' and 2 lakhs as 'non-earning dependents') in the 1951 figures for North-West India

against 1,035 lakhs of 'earners' in 1931. The 'self-supporting persons' of 1951 are actually fewer than the 'earners' of 1931 in three zones—North India, South India and Central India. This, however, does not signify much, because, as explained earlier the 'earners' of 1931 include not only all these whom we now call 'self-supporting persons' but also some among those whom we now call 'earning dependents'. For the same reason, we should not also be misled by the large difference in numbers between the 'working dependents' of 1931 (189 lakhs) and the 'earning dependents' of 1951 (379 lakhs).

The true comparison lies between the sum total of earners and working dependents in 1931, and the self-supporting persons and earning dependents in 1951; or, which comes to the same thing, between the non-working dependents of 1931 and non-earning dependents of 1951.

14 It will be observed that though the total population of India had increased from 2,754 lakhs in 1931 to 3,569 lakhs in 1951, we have only 1,045 lakhs of 'self-supporting persons' in 1951

This comparison is shown in TABLE 12.

TABLE 12

Zones	1931 Ratios		1951 Ratios	
	Earners + working dependents	Non- working dependents	Self- supporting persons + earning dependents	Non- earning dependents
North India	48	52	43	57
East India	41	59	37	63
South India	42	58	31	69
West India	40	60	43	57
Central India	51	49	49	51
North-West India	46	54	45	55
INDIA	44	56	40	60

15 If the figures of TABLE 12 may be accepted as correct, they show that in India as a whole non-earning dependency has increased from 56 to 60—a similar increase is observed in all zones except West India, and that the rates of increase in different zones (arranged in order of this increase) are South India (11 per cent), North India (5 per cent), East India (4 per cent), Central India (2 per cent) and North-West India (1 per cent). The decrease in West India is 3 per cent.

Before proceeding to examine the probable causes of this change, we should make sure that the increase can be accepted as having really occurred. The doubt arises because, as we have already seen, we must allow for the possibility of non-comparable classification of marginal cases in different parts of the country, and the same reason would call for care in comparing the results of two different censuses in the same part of the country.

In these circumstances we cannot be absolutely certain that we are drawing correct inferences from figures, nevertheless the social and economic importance of the phenomena we are examining is such that we ought to try and formulate those conclusions which available data indicate as probable, even though we cannot be certain that their correctness is established beyond doubt.

It has been observed already in relation to comparison between different parts of India, that the line drawn between non-earning dependents and earning dependents is less likely to be materially non-comparable than the line drawn between earning dependents and self-supporting persons. Much the same considerations apply to comparison between the 1951 Census and 1931 Census for the same area. While an increase of say about 2 per cent among non-earning dependents may be regarded as being too small to be asserted as significant—it is hardly likely that a four per cent increase could have arisen by accidental variation. In the circumstances, we may state our conclusions as follows:

Firstly.—It is reasonably certain that non-earning dependency has not decreased but has on the other hand probably increased to some extent in the country as a whole during the twenty years between 1931 and 1951;

Secondly.—There may have been a small increase of non-earning dependency in Central India and North-West India and a small decrease in West India but the evidence in either case is not very definite, and

Thirdly.—It is reasonably certain that non-earning dependency has not decreased but has probably increased to some extent in East

India. A somewhat larger increase of non-earning dependency has occurred in North India and the largest increase among all zones has occurred in South India.

These conclusions cannot (having regard to the nature of the evidence) be asserted as proved beyond all doubt. But we are justified in accepting them as probably what has happened.

(16) Why did non-earning dependency increase? A natural explanation would be forthcoming if there had been a disproportionate increase of women or children. In 1931, there were 951 females per 1,000 males. In 1951, this had become 947 which indicates that the sex-ratio was not a material factor in the country as a whole. In South India, where there is the largest increase of non-earning dependency, the sex-ratio had declined from 1,010 to 999. The largest increase in the sex-ratio took place in North-West India (from 863 to 883) and we see that it is by no means definite that non-earning dependency increased in this zone. We may, therefore, dismiss any changes in the sex-ratio as a probable cause of any significant increase of non-earning dependency. A comparison of age-structure is difficult in view of a great many territorial changes, but sufficient indication is provided by the figures given below for four large states:

TABLE 13

State	Number per 1,000 males who were aged 15 to 54	
	1931	1951
Uttar Pradesh	550	535
Madhya Pradesh	535	539
Bombay	550	543
Madras	533	549
All four states	542	541

In relation to the total population, males of working age have, on the whole, neither increased nor decreased. So this cannot also be a general explanation of a wide-spread increase of non-earning dependency. It seems possible, however, that it may have played some part locally, as for instance, in Uttar Pradesh.

(17) One other reason which might have given rise to an increase of non-earning dependency is the fact that elementary education has been making progress in most parts of the country and it is possible that a considerable number of children who might have been reckoned as 'working dependents' or even as 'earners' in 1931 might have become 'non-earning dependents' in 1951, either because they were going to school, or because the proportion of children who lend a hand in the cultivation of the family holding or otherwise contribute to the income of the family might be smaller among literate children than among illiterate children.

These things are possible. It is even probable that the progress of literacy has had some effect. But it is very difficult to assess the significance of that effect. The following table shows the progress in the percentage of literacy among boys (males aged 5-14) between 1931 and 1951 in a number of states:

TABLE 14

State	Percentage of boys who are literate	
	1931	1951
Uttar Pradesh	5.3	15.4
Bihar-and-Orissa	4.9	19.2
Madras	9.1	23.3
Mysore	9.6	30.3
Travancore-Cochin	25.8	50.1
Bombay	10.6	34.0
Madhya Pradesh	6.1	20.2
Hyderabad	5.4	13.2

As boys (aged 5-14) number roughly one-eighth of the population and as the progress of literacy among them has been generally well-marked, a sizable diminution of juvenile employment *might* have occurred, on this account. But it is far from certain that the diminution which did occur was, in fact, *sizable*. We can not be sure about this unless we had a break-up of literacy data between villages and towns separately for both 1931 and 1951, and also a correlation between literacy, age and gainful employment. We do not possess such data. It is, therefore, very difficult to pass over from the known figures of progress of literacy to any clear conclusions about non-earning dependency.

On the other hand, the need for reserve in drawing what may appear to be a plausible conclusion is indicated by the figures of TABLE 11, from which it appears that while 'working dependents' were only 6.9 per cent of the population of India in 1931, 'earning dependents' were 10.6 per cent of the population in 1951. Granted that there were some women and children who were only earning dependents but were classed as 'earners' and omitted from 'working dependents' in 1931—they could have been only a relatively small fraction of the total number of 'working dependents' of 1931. Thus, it is fairly clear that while non-earning dependency has increased, earning dependency (in the strict sense of the 1951 Census) has certainly not declined—and has possibly also increased somewhat during the twenty year period. It is true that this fact does not prove that a selective reduction in the proportion of earning dependents could not have occurred in the age-group 5 to 14, for such a reduction might have occurred and been offset by more than corresponding increase in the older age-groups. On the whole it would seem safe to say that there was sufficient progress in literacy to have had some effect in diminishing juvenile employment. It would not, however, be safe, to attribute the entire increase of non-earning dependency to such cause, or even perhaps a very substantial part of such increase.

18 There is little doubt that the main cause is economic and must be looked for in the circumstance that a very large proportion of the people depend on agriculture and the area of cultivated land did not increase in the same proportion as the population. The area of cultivated land *per capita* has been computed for 1931, by striking the average* for five years preceding 1931 and dividing by the 1931 Census population. It has been computed similarly for 1951 by striking the average* for five years preceding 1951 and dividing by the 1951 Census population. The results are shown below.

(i) NORTH INDIA—With the exception of one division the area of cultivated land *per capita* has declined in all the divisions of Uttar Pradesh (the only state of this zone).

*Such averages are necessary for purposes of comparison because there is a considerable amount of fluctuation of the area from each year to the next because of the vicissitudes of the seasons.

TABLE 15

Natural division	Area of cultivated land per capita (IN CENTS)	
	1931	1951
East U. P. Plain . . .	63	53
Central U. P. Plain . . .	66	55
West U. P. Plain . . .	77	65
U. P. Hills & Plateau . . .	116	112
Himalayan Uttar Pradesh . . .	54	72
Uttar Pradesh . . .	72	62

The Cultivation Statistics of this state are among the best in India and can be relied on. (As it happens, there is some doubt about the statistics of the one division—Himalayan Uttar Pradesh—where an increase of the area of cultivated land *per capita* is recorded.)

(ii) EAST INDIA—The figures for states in this zone are of doubtful accuracy. They are shown below for what they are worth :

TABLE 16

State	Area of cultivated land per capita (IN CENTS)	
	1931	1951
Bihar	63	57
Orissa	99	83
West Bengal	43	45
Assam	63	58

As it happens, we know for certain that the increase recorded in West Bengal is incorrect because the Method of estimation of acreage was changed in 1943 so as to render the figures for all preceding years non-comparable with those of succeeding years†.

†Farquhar Inquiry Commission Report of Bengal pages 147, 206 and 207.

(iii) SOUTH INDIA—Figures are available for Madras, Mysore and Travancore-Cochin. The cultivation statistics of the first two states are among the best in India. The statistics of Travancore-Cochin are not so reliable.

TABLE 17

Natural division/State	Area of cultivated land per capita (IN CENTS)	
	1931	1951
Madras Deccan	189	147
West Madras	41	33
North Madras	71	55
South Madras	59	44
Madras	72	54
Mysore	99	70
Travancore-Cochin	40	30

The figures show not only the pervasive character of the decline in the area of cultivated land *per capita* in all parts of this zone, but also the larger magnitude of the decline as compared with the two other zones noted already.

(iv) WEST INDIA—Figures are available only for Bombay. The cultivation statistics of this state are also among the best in India. But, unfortunately, they have been somewhat spoiled by the inclusion shortly before 1951, of large numbers of 'merged' states (which had no good statistics) in almost every district of the state and the difficulty of separating, after merger, the statistics of the newly added areas from those of the old areas. Even so, it is likely that the '*per capita*' figures for 1931 and 1951 are not materially affected and they can be accepted as showing not merely the direction but the magnitude of the change as well. Figures for 1941 (when this complication did not exist) are also furnished

below in order to corroborate the trend disclosed by the figures of 1931 and 1951.

TABLE 18

Natural division	Area of cultivated land per capita (IN CENTS)		
	1931	1941	1951
Bombay Deccan Northern	202	184	151
Bombay Deccan Southern .	231	207	180
Bombay Gujrat .	134	108	114
Bombay Konkan .	62	59	48
Bombay	156	137	118

It is clear, notwithstanding the statistical difficulty mentioned above (which is prominently visible in Bombay-Gujrat), that the area of cultivated land *per capita* has declined to just as large an extent as in South India, and no less pervasively.

(v) CENTRAL INDIA—We have figures for only Madhya Pradesh—the other major states (Hyderabad and Madhya Bharat) not having comparable statistics. The Bombay complication has been avoided here as it was possible to separate and exclude the figures for the 'merged' states. The statistics are of the same high order of reliability as in Madras and Uttar Pradesh.

TABLE 19

Natural division	Area of cultivated land per capita (IN CENTS)	
	1931	1951
North-West Madhya Pradesh	171	143
East Madhya Pradesh . .	128	113
South-West Madhya Pradesh	190	156
Madhya Pradesh	161	135

There is a pervasive decline of the area of cultivated land *per capita*. It is relatively larger than in East India and North India but not so large as in South India or West India.

(vi) NORTH-WEST INDIA.— We have no good statistics for Rajasthan but we have reliable figures for the Punjab. They are furnished below—

TABLE 20

Natural division	Area of cultivated land per capita (IN ACRES)	
	1931	1951
Himalayan Punjab	61	49
Punjab Plains	109	99
Punjab	106	95

There is a decline but it is not so large as even in North India and much less than in Central, South or West India.

(19) These figures establish conclusively and in precise quantitative terms what is generally known or believed to be true—that the extension of cultivation has failed to keep pace with the growth of population in almost every part of the country. There has been a substantial and pervasive decline of the area of cultivated land per capita throughout the country. The extent of decline has varied from one part of the country to another. The severity of the decline is notable in South India where the increase of non-earning dependency has also been heaviest. But, we observe, that the decline is no less severe in West India. Why was there no increase of non-earning dependency there? The answer seems to be as follows.

A significant decline in the area of cultivated land per capita may be met by the people who work on such land and subsist on its produce in different ways

First,—They may transfer themselves to non-agricultural employment. Where this occurs,

non-agricultural employment must have increased at a faster rate than the growth of population; and the fall may be evidenced by a diminution in the relative proportion of gainfully occupied persons who are working in agriculture, as well as of the proportion of the total population which subsists on agriculture.

Secondly,—They may continue to work on the land, but in increased numbers on the same area of cultivated land. This means, really, an increase of under-employment on the land. Where this occurs, the fact might be evidenced by an increase in the percentage of earning dependents—if these are classified in the strict sense of the 1951 Census.

Thirdly.—The proportion of people who are not gainfully occupied, but depend on others to maintain them, may increase. In other words, there may be an increase of general unemployment. Where this occurs, it will be reflected in an increase of non-earning dependency (without a corresponding increase in the proportion of women and children).

The main answer thus, to the question why South India shows a reaction of the third type mentioned above so prominently, while it is absent in West India must presumably be found in the differences between the two zones in respect of the growth of non-agricultural employment. Whether there is also a difference between the two in respect of increased under-employment on the land must also be a matter for investigation. We may conclude that the increase of non-earning dependency during the last 20 years in the country as a whole, as well as in four of its six zones, is the consequence mainly of the decline in the area of cultivated land per capita. The extent of increase is not necessarily in strict proportion to the amount of the decline, because it is likely to have been affected in part by the extent to which non-agricultural employment has increased and in part, by the extent to which agricultural under-employment has increased. In the next part of this note we shall examine how far this view is supported by the figures relating to changes in agricultural class structure.

PART C

Review of Data relating to Agriculture

I—THE 1951 CENSUS PICTURE

1 The total strength of the 'agricultural classes' in India was 2,491 lakhs out of a classified population of 3,566 lakhs. They should not be identified with the 'rural population'. Some members of the agricultural classes live in towns—especially the smaller towns. There is a sizable proportion of people living in villages who get their livelihood from some industry or service other than cultivation and are therefore classified as 'non-agricultural classes'. The following table shows the comparison between the members of the 'rural population' and the 'agricultural classes' in India and the zones.

TABLE I
(IN LAKHS)

Zones	General Population	Rural Population	Agricultural classes
North India	632	546	469
East India	901	802	681
South India	756	607	486
West India	407	280	243
Central India	523	440	383
North-West India	350	275	229
INDIA	3,569	2,950	2,491*

2 Whereas the rural population is 82.7 per cent of the general population, the agricultural classes number 69.8 per cent of the general population. The percentage of agricultural classes is highest in East India (75.6) and lowest in West India (59.7). The percentages in other zones, in order, are 74.2 in North India, 73.2 in Central India, 66.0 in North-West India and 64.3 in South India.

The agricultural classes exceed 80.0 per cent of the population in the following divisions:

NORTH INDIA—East Uttar Pradesh Plain

EAST INDIA—All the three divisions of Bihar, the Inland division of Orissa, Assam Hills, Manipur and Sikkim

CENTRAL INDIA—East Madhya Pradesh, Madhya Bharat Hills and Vindhya Pradesh.

NORTH-WEST INDIA—Himalayan Punjab, Himachal Pradesh and Bilaspur

The Agricultural Classes fall short of 60.0 per cent of the population in the following divisions (apart from Delhi, Amritsar & Greater Bombay):

EAST INDIA—Himalayan West Bengal and West Bengal Plain

SOUTH INDIA—West Madras, Travancore-Cochin and Coorg

WEST INDIA—Saurashtra and Kutch

3 Agricultural classes (it has already been explained) include not only those who are gainfully employed on cultivation, but also all persons who are supported by income derived from the cultivation of land and all other persons who depend on such persons for their subsistence. If we compare the agricultural classes with the general population in respect of household economic status, the result is:

	Percentage to general population	Percentage to agricultural classes
Self-supporting persons	29.3	28.5
Earning dependents	10.6	12.5
Non-earning dependents	60.1	59.0
TOTAL	100.0	100.0

There is a small deficiency of self-supporting persons (0.8 per cent). This is observable in all zones except North-West India—North India (0.8), East India (1.6), South India (0.6), West India (2.4), Central India (0.3). In North-West India the percentage of self-supporting persons

*The total population of agricultural classes for India is 2,491 by adding up the zonal figures, while the figures arrived at by adding up the numbers in Livelihood Classes I, II, III & IV, is 2,490 vide TABLE 2. The difference is due to rounding of figures when taking the population in lakhs.

of agricultural classes exceeds that of the general population by 1.3 per cent

In every zone, the percentage of earning dependents of members of agricultural classes exceeds that of the general population

In the result, the percentage of non-earning dependents is higher among agricultural classes than in the general population in two zones—East India (1.0) and South India (0.4). The percentage of non-earning dependents is lower among agricultural classes in the other four zones and the differences being as follows: North India (1.4), West India (3.1), Central India (2.5), and North-West India (4.1)

4. The members of the agricultural classes (numbering 2,490 lakhs) have been divided into four classes as below.

TABLE 2

Livelihood Class	Number (in lakhs)	Percentage of agricultural classes	Percentage of general population
I	1,673	67.2	46.9
II	316	12.7	8.9
III	448	18.0	12.6
IV	53	2.1	1.5
TOTAL	2,490*	100.0	69.9

This table brings out three features of agricultural class structure which are important and not always fully appreciated.

First,—The numerical insignificance of agricultural renters. Livelihood Class IV consists, as already explained, of two distinct sets of people—one set of people are those who 'own' land in the sense of having a permanent and heritable right to occupy and cultivate it but who entrust the cultivation to others and subsist on the rent received from the tenant-cultivator. The other set of people consists of people who are proprietors of zamindaris or other estates, and in that capacity are entitled to receive

rent from the owners of land situated in such estates, in the same way as Government receive land revenue from the owners of land in raiyatwari villages which are not parts of estates. The first set of people can be found in all parts of the country while the second set of people can only be found in those parts of country where zamindari or other similar estates exist. It is not necessary to suppose that all these people are 'land-lords' in the sense of being very rich persons—they comprise people drawn from all income groups. All such people form only 1.5 per cent of the general population and 2.1 per cent of the agricultural classes in India.

Secondly,—The high ratio of 'cultivators' to 'cultivating labourers'. Livelihood Classes I and II consist of cultivators (and their dependents). They undertake the responsibility of cultivating and their income consists of the net profits of cultivation. They are self-employed persons. Livelihood Class III, on the other hand, consists of a different set of people viz., cultivating labourers (and their dependents). The cultivating labourers do not undertake the responsibility of cultivation—they do the work allotted to them by the cultivators who employ them. They are employees—and their income consists of agricultural wages.

The 1951 Census shows that in India cultivators (and their dependents) comprise 55.8 per cent of the general population (or 79.9 per cent of the agricultural classes); while cultivating labourers number only 12.6 per cent of the general population (or 18.0 per cent of the agricultural classes). The ratio between the two—cultivators and cultivating labourers—(inclusive of dependents) is 82:18.

It is often believed that cultivating labourers are much more numerous than this; and, as a superficial comparison with the 1931 Census might lend some support to the view that the numbers are probably understated at the present census, the figures have been studied thoroughly. The outcome of this study may be stated at once—the figures given above represent a true picture of the present position in India.

Thirdly,—The high ratio of 'owner cultivators' to 'tenant-cultivators'. Livelihood Class I

*See footnote c under Para 1

consists of all people whose main source of income is the cultivation of land owned by them. They include people who *also* cultivate rented land in addition to their own. In such case the income from rented land is less important than the income from owned land. On the other hand, Livelthood Class II consists of all people whose main source of income is the cultivation of land rented from someone else who owns the land. Such persons may also own and cultivate small patches of land, but if the income derived therefrom is less important than the income from rented land, they are placed in Livelthood Class II. (We shall refer to these as 'owner-cultivators' and 'tenant-cultivators' the names being convenient. But it should be clearly remembered that a great many people are called 'tenants' but yet they possess a permanent and heritable right of occupancy in the land they hold. Such people are classified as 'owner-cultivators' and *not* as 'tenant-cultivators').

The 1951 Census figures show that, in the country as a whole the ratio of owner-cultivators to tenant-cultivators is 84.16.

We shall now proceed to examine the figures zone by zone, in order to see how these three main features are reproduced.

4. NORTH INDIA.—The numbers and percentages of the four agricultural classes in North India are as shown below.

TABLE 3

Livelihood Class	Number (IN LAKHS)	Percentage of agricultural classes	Percentage of general population
I	394	83.9	62.3
II	32	7.0	5.2
III	36	7.7	5.7
IV	7	1.4	1.0
TOTAL	469	100.0	74.2

The figures show that all the three features mentioned about India are prominently emphasized in North India. Agricultural renters are only 1.0 per cent which is distinctly smaller than the India figures which are themselves very small.

The zonal ratio of cultivators to cultivating labourers is higher than the India ratio; it is 92.8, against India's 82.18.

The zonal ratio of owner-cultivators to tenant-cultivators is also higher than the India ratio, it is 92.8, against India's 84.16.

The following table shows how these three features vary in the different divisions of North India.

TABLE 4

Natural division	Percentage of agricultural renters	Ratio of Cultivators to cultivating labourers	Ratio of owner-cultivators to tenant-cultivators
East U P Plain	0.7	92.8	91.9
Central U P. Plain	1.8	93.7	92.8
West U P Plain	2.0	92.8	94.6
U P Hills & Plateau	1.7	85.15	88.12
Himalayan U P	0.3	99.1	94.6

Himalayan Uttar Pradesh is remarkable for its virtual absence of agricultural renters and cultivating labourers. On the other hand, U.P. Hills and Plateau division is distinguishable from the rest of Uttar Pradesh in having somewhat larger numbers of cultivating labourers as well as tenant cultivators. Even in this division, however, their proportions are well below the India averages.

5. EAST INDIA.—The numbers and percentages of the agricultural classes of East India are shown below.

TABLE 5

Livelihood Class	Number (IN LAKHS)	Percentage of agricultural classes	Percentage of general population
I	451	66.2	50.0
II	86	12.4	9.4
III	138	20.3	15.2
IV	7	1.1	0.8
TOTAL	682	100.0	75.6

Agricultural renters are even fewer in East India than in North India—the proportion is about one-half of the India figures

But cultivating labourers and tenant-cultivators are clearly more numerous than in North India and close to the India average

The zonal ratio of cultivators to cultivating labourers is 79 21, while that of owner-cultivators to tenant-cultivators is 84 16

There are fairly wide variations among the different divisions of this zone, as may be seen from the table below

TABLE 6

Natural division	Percentage of agricultural renters to agricultural classes	Ratio of cultivators to cultivating labourers	Ratio of owner-cultivators to tenant-cultivators
North Bihar	0 6	67 33	81 19
South Bihar	1 1	71 29	85 15
Chhota Nagpur	0 5	91 9	97 3
Orissa Inland	0 9	84 16	94 6
Orissa Coastal	3 2	84 16	87 13
West Bengal Plain	1 1	77 23	75 25
Himalayan W Bengal	0 7	94 6	58 42
Sikkim		100 0	92 8
Assam Plains	1 4	98 2	79 21
Assam Hills	0 6	97 3	95 5
Mizoram	2 4	100 0	88 12
Tripura	2 5	93 7	87 13

North Bihar, and West Bengal Plain stand out in this zone, with distinctly larger numbers of cultivating labourers and tenant-cultivators than the India average South Bihar has a high proportion of cultivating labourers, and Himalayan West Bengal has an unusually high proportion

of tenant cultivators together with a very low proportion of cultivating labourers

In Assam, cultivating labourers are negligible in number both in the Plains and the Hills But where as tenant cultivators are also negligible in the Hills—they are quite considerable in the plains

6 SOUTH INDIA —The numbers and percentages of agricultural classes in South India are shown below

TABLE 7

Livelihood Class	Number (IN LAKHS)	Percentage of agricultural classes	Percentage of general population
I	275	56 6	36 3
II	66	13 5	8 7
III	129	26 6	17 1
IV	16	3 3	2 1
TOTAL	486	100 0	64 2

The agricultural class structure in South India, it is evident, differs sharply from North India and even East India Whereas agricultural classes, as a whole, are nearly three-fourths of the general population in North India and East India, they are less than two-thirds in South India Whereas owner-cultivators numbered over three-fifths of the general population in North India and one-half in East India, they are little more than one-third of the general population in South India Nevertheless, it should be noted that even in South India, the owner-cultivators form an absolute majority among the agricultural classes. They are clearly more numerous than tenant-cultivators, cultivating labourers and agricultural renters taken together The agricultural renters are small in number, though the percentage is somewhat higher than India's average

The zonal ratio of cultivators to cultivating labourers is 73 27, which is distinctly smaller

than India's 82 : 18 and very different from North India's 92 : 8. The zonal ratio of owner-cultivators to tenant-cultivators is 81 : 19, which is slightly lower than India's 84 : 16, and much smaller than North India's 92 : 8.

The pattern within the zone is far from uniform. It varies among different divisions as shown below.

TABLE 8

Natural division	Percentage of agricultural rentiers to agricultural classes	Ratio of cultivators to cultivating labourers	Ratio of owner-cultivators to tenant-cultivators
Mysore . .	4.1	90.10	92.8
Madras Deccan .	3.9	79.21	90.10
North Madras .	3.4	67.33	83.17
South Madras .	3.0	74.26	82.18
West Madras . .	4.5	60.40	26.74
Travancore-Cochin	2.3	62.38	79.21
Coorg . .	5.4	80.20	77.23

Mysore stands apart with very low proportions both of tenant-cultivators and cultivating labourers, but (curiously enough) it has second highest proportion in the zone, of agricultural rentiers.

Otherwise, all the divisions are conspicuous in having a fairly high proportion of cultivating labourers—the North Bihar proportion (the highest in East India being equalled or exceeded in North Madras, Travancore-Cochin and West Madras). West Madras is altogether exceptional not only because it has the highest proportion of cultivating labourers but also because its 'tenant-cultivators' outnumber its owner-cultivators by nearly three to one. With the doubtful exception of Himalayan West Bengal, there is no division in any of the three zones so far reviewed, with an agriculture class structure even remotely resemble in West Madras. The figures point clearly to a peculiarity in the land tenure system.

7 WEST INDIA.—The numbers and percentages of the agricultural classes in West India are shown below.

TABLE 9

Livelihood Class	Number (IN LAKHS)	Percentage of agricultural classes	Percentage of general population
I	162	66.6	39.8
II	39	16.0	9.5
III	34	14.1	8.4
IV	8	3.3	2.0
TOTAL	243	100.0	59.7

The agricultural classes, on the whole, are just under three-fifths of the general population—the smallest proportion among all the six zones of India.

As usual, agricultural rentiers are quite small in relative number. The zonal ratio of cultivators to cultivating labourers is 85 : 15, which is rather higher than India's 82 : 18, though not quite so high as North India's 92 : 8.

The zonal ratio of owner-cultivators to tenant-cultivators is 81 : 19 which is the same as that of South India.

The variations within the zone are shown below :

TABLE 10

Natural division	Percentage of agricultural rentiers to agricultural classes	Ratio of cultivators to cultivating labourers	Ratio of owner-cultivators to tenant-cultivators
Bombay Deccan Northern .	2.9	84.16	93.7
Bombay Deccan Southern .	4.4	78.22	81.19
Bombay-Konkan .	2.5	92.8	49.51
Greater Bombay .	34.3	74.26	67.33
Bombay-Gujarat .	3.3	86.14	81.19
Saurashtra . .	3.8	92.8	80.20
Kutch . .	3.8	93.7	74.26

The figures of Greater Bombay are freakish—naturally so, because they relate to one-half of one per cent of the population of a large city. The other divisions call for the following comments. Cultivating labourers are found in relatively large numbers in the Southern division of Bombay Deccan; and they are notably small in numbers in Bombay-Konkan, Saurashtra and Kutch. The tenant-cultivators are on the high side in all divisions except Bombay Deccan Northern. They are exceptionally numerous in Bombay-Konkan recalling in this respect the position in West Madras and Himalayan West Bengal. A peculiarity of the local land tenure system is clearly indicated.

8 CENTRAL INDIA.—The numbers and percentages of the agricultural classes of this Zone are shown below.

TABLE 11

Livelihood Class	Number (IN LAKHS)	Percentage of agricul- tural classes	Percentage of general popula- tion
I	248	64.7	47.3
II	34	9.0	6.6
III	92	24.0	17.6
IV	9	2.3	1.7
TOTAL	383	100.0	73.2

In this zone, the over-all proportion of agricultural classes to general population is high, nearly three-fourths—the zone ranks next after East India and North India.

As in all other zones, the agricultural renters are small in number. The zonal ratio of cultivators to cultivating labourers is low 75.25 (almost the same as in South India). But the zonal ratio of owner-cultivators to tenant-cultivators is high 88.12.

Within the zone the variations are as follows.

TABLE 12

Natural division	Percentage of agricul- tural renters to agricul- tural classes	Ratio of cultivators to cultivating labourers	Ratio of owner- cultivators to tenant cultivators
Madhya Pradesh			
North-West	2.8	75.25	91.9
East	1.3	80.20	95.5
South-West	3.4	53.47	80.20
Hyderabad			
North	4.3	70.30	90.10
South	3.1	76.24	82.18
Madhya Bharat			
Hills	1.1	85.15	90.10
Plateau	1.4	81.19	84.16
Lowland	0.9	95.5	75.25
Vindhya Pradesh	0.6	80.20	91.9
Bhopal	1.8	69.31	84.16

The general pattern of Central India is fairly uniformly distributed over all divisions. South West Madhya Pradesh, however, stands out with an exceptionally high proportion of cultivating labourers. The very low proportion of tenant-cultivators in East Madhya Pradesh is also a notable feature.

9 NORTH-WEST INDIA.—The numbers and percentages of the agricultural classes of North-West India are shown below.

TABLE 13

Livelihood Class	Number (IN LAKHS)	Percentage of agricul- tural Classes	Percentage of general popula- tion
I	144	63.0	41.5
II	60	26.2	17.3
III	19	8.1	5.4
IV	6	2.7	1.8
TOTAL	229	100.0	66.0

The agricultural rentier percentage is, as usual, low. The zonal ratio of cultivators to cultivating labourers is high 92 : 8, the same as in North India. The zonal ratio of owner-cultivators to tenant-cultivators is rather low being 71 : 29.

[It should be mentioned here that the ratio should normally have been higher, but it is temporarily depressed as a result of mass migration of population in this zone, the displaced persons newly settled on the land, not having acquired permanent and heritable rights]

The variations within the zone are shown below :

TABLE 14

Zonal division	Percentage of agricultural rentiers to agricultural classes		Ratio of cultivators to cultivating labourers		Ratio of owner-cultivators to tenant-cultivators	
East Rajasthan Plain	2.3		97.3		67.33	
Rajasthan Dry Area	1.5		98.5		38.62	
Rajasthan Hills	2.3		97.3		92.8	
Rajasthan Plateau	3.7		96.1		95.5	
Himalayan Punjab	2.0		98.2		80.11	
Punjab Plain	5.4		94.6		68.42	
Mitchal Pradesh and Bihar	1.8		98.2		92.8	
UP	1.2		98.8		81.10	
Delhi	1.3		98.7		87.13	
Amer	4.4		95.6		83.8	

Rajasthan Dry Area and Rajasthan Hills. As regards divisions with a low ratio of cultivators to cultivating labourers there are none in North India, North-West India or (with the insignificant exception of Greater Bombay), in West India. In the other zones a low ratio is found in North Bihar and South Bihar in East India, North Madras, South Madras, West Madras and Travancore-Cochin in South India, North Hyderabad (South Hyderabad is on the margin), South-West Madhya Pradesh, North-West Madhya Pradesh, and Bhopal in Central India. The lowest ratio among all the divisions in India is found in South-West Madhya Pradesh (53.47), the next two being West Madras (60.40) and Travancore-Cochin (62.38).

12 *Ratio of owner-cultivators to tenant-cultivators* ; In the country as a whole, there are 84 owner cultivators (with dependents) to 16 tenant-cultivators (with dependents).

We may, in this case also, define a ratio of 90 or more owner-cultivators to 10 or less tenant-cultivators as a high ratio, and 75 or less owner-cultivators to 25 or more tenant-cultivators as a low ratio. Then we find high ratios prevailing in the following divisions. All divisions of North India, except Uttar Pradesh Hills and Plateau (they also have a high ratio of cultivators to cultivating labourers), Chhota Nagpur, Orissa Inland, Sikkim and Assam Hills in East India, Mysore and Madras Deccan in South India, Bombay Deccan Northern in West India, North-West Madhya Pradesh, East Madhya Pradesh, North Hyderabad, Madhya Bharat Hills and Vindhya Pradesh in Central India, Rajasthan Hills, Rajasthan Plateau, Ajmer and Humachal Pradesh and Bilaspur in North-West India.

There are no divisions in North India with a low ratio of owner-cultivators to tenant-cultivators. A low ratio is found in West Bengal Plain as well as Himalayan West Bengal in East India, West Madras in South India, Kutch, Greater Bombay and Bombay-Konkan in West India, Madhya Bharat Lowland in Central India, and the following divisions of North-West India viz., Punjab Plains (which, as mentioned already, is an exceptional temporary phenomenon), East Rajasthan Plains and Rajasthan Dry Area.

13. What do the observed differences of agricultural class structure in different divisions of India signify? Do they indicate any correlation with the population characteristics of different divisions? It is not possible to answer these questions conclusively without more detailed and prolonged study. The following comments may, however, be made.

First.—It may be thought, on *a priori* grounds, that the greater the density of settlement of the population on the lands the stronger must be the tendency to sublet the land for cultivation, or to employ hired labour in large numbers or both. Such a view might, at least, be regarded as justifiable if the pressure of population on land is measured by some more refined index than crude density—such an index, for instance, as the proportion of actual usage of usable land.

The figures lend little support to the opinion that any such correlation exists. There is no doubt that the pressure of population on land must exert some such effect, but it seems to be relatively less important than the consequences of the working of laws, administrative practices and established customs which define land tenure.

Secondly.—There appears to be a very widespread misunderstanding of the real nature of the distinction between the three main land-tenure systems of the country—the rayatwari system, the temporarily settled zamindari system and the permanently settled zamindari system, and between all three of them and other minor systems of local importance. It is, for instance, often supposed that the zamindari estates (now in process of acquisition by the State in many parts of the country) comprised very large areas of cultivated land, whose disposition was in the hands of 'landlords' who employed large masses of ill-paid labourers to cultivate them or let them out, according to their will and pleasure, to rack-rented tenants who had no security of tenure. It would be natural, on this quite erroneous view, to look for a high proportion of agricultural renters, a small ratio of owner-cultivators to tenant-cultivators and an equally small ratio, perhaps, of cultivators to cultivating labourers in those parts of the country where the zamindari system prevailed in 1951. The figures

which we have already reviewed, contradict this error and confirm what would be expected by people who had a correct knowledge of the land-tenure system of India.

14. The question will nevertheless be asked: Can these figures be accepted as correct? Might they not be vitiated by error? Let us run over the possible sources of error.

Were the concepts understood by the enumerators and applied correctly? There is no doubt about the answer in all those states where village land record establishments (*patwaris*, *karnams* etc.) exist. To them, the distinction between Livelihood Classes I, II, III and IV was child's play, as indeed it would be to anyone born and brought up in villages. In other places the concepts needed explaining, but very special emphasis was laid on this topic and the necessary explanations were provided. The reports of Superintendents of Census Operations indicate that there was much less difficulty about these concepts than in drawing a line between earning dependants and self-supporting persons. With the possible exception of isolated areas where town dwellers had to be employed as enumerators in villages and did not receive sufficient instructions, it is most unlikely that any material error was introduced by failure of enumerators to understand what was wanted.

Could wrong answers have been given by the citizens themselves? There are three distinct contingencies in which this could have happened.

15. One has been described as 'category climbing'. Membership of Livelihood Class I involves a higher social status than membership of Livelihood Class II and *a fortiori* of Livelihood Class III. It was possible that some, who should be correctly described as II, described themselves as I, and some, who should be correctly described as III, described themselves as II or even I.

It is, however, exceedingly improbable that people would be tempted to make such mis-statements and succeed in making them before enumerators who had local knowledge *except* in the marginal cases—such as where a person cultivates both rented land and a piece of owned land and called himself I on the strength of the latter, though it was not his more important source of income. No reports suggest the possibility of category-climbing *except* in such marginal

cases. We have figures showing the numbers of such cases—because the principal means of livelihood, and the secondary means of livelihood (where one exists) have both been ascertained by separate questions. These figures have been scrutinised. They show that it is possible to define a margin of uncertainty by isolating all such cases. It has been verified that the margin is quite small. We may take it that 'category-climbing' exists, but the picture presented by the figures has not been materially affected, much less distorted, by it.

16. Another possibility of erroneous returns arises in the context of proposals for changes in the prevailing systems of land tenure. There are two different ways in which this possibility may express itself. It has been suggested probably with justification, that there is a tendency in some parts of the country for owners of land who do not cultivate it directly to claim that they do—because of the apprehension that some new legislation might be undertaken, as a result of which people who do not cultivate their land would be suddenly deprived of their rights without just compensation. It is difficult to be sure whether, and if so, where and to what extent this apprehension actually led to wrong returns. Fortunately, it is demonstrable by reference to the 1931 Census figures, that the low ratios now observed are *not* abnormal and are paralleled by similar ratios in 1931. At that time there was not only no such apprehension but membership of Livelihood Class IV involved even higher Social Status than Livelihood Class I and would, therefore, have been preferred by 'Category-climbers' in the marginal cases.

17. More important are the cases where the proper classification of a person is in genuine doubt or dispute. There are some localities where it can be both asserted and denied—a perfect good faith—that a person is a cultivating labourer and not a tenant-cultivator and *vice versa*. At the same time it is quite likely that there are, in some areas, considerable numbers of persons who are, without doubt, tenant-cultivators and who are, equally without doubt, persons without just claim to occupancy rights in land. They may not be acknowledged as such and may be admitted to possession of land expressly on the footing of cultivating labourers, for the reason that the owner of land wish to safeguard themselves against loss of their own occupancy rights. It is, therefore, possible, that there might be areas where the cultivators have long held land on a certain

tenure giving them the substance of occupancy rights—which are not, however, recognised by statute law or enforced by Courts. Such ambiguous or uncertain relations apply rarely to villages under the major systems of land tenure—whether rayatwari, permanently settled zamindari or temporarily settled zamindari. They apply to the miscellaneous tenures—*'Inams'* jagirs and the like—which were excluded or reserved in vague terms when the major settlements were effected, and then evolved for several decades in different ways in different parts of the country. The general trend of legislation in the last few decades has been to resolve subsisting doubts in favour of the cultivator, and the present trend is to extend such legislation to cases where no doubts exist. In the light of this explanation of the sources of possible doubts and disputes, it is significant that the divisions which are thrown up as having an unusually small ratio of owner-cultivators to tenant-cultivators are those in which the exceptional types of tenures prevail e.g., West Madras (26.74), Rajasthan Dry Area (38.62), Bombay-Konkan (49.51), Himalayan West Bengal (58.42), East Rajasthan Plain (67.33).

In general, it may be concluded that the Census figures correctly reflect the reality of agricultural class structure in the country.

18 We may now revert to the basic ratio with which we started, viz., the proportion of agricultural classes to the general population 69.9 per cent for India. It is necessary to re-emphasize the fact that this is the proportion which we get when we consider not only the persons who derive their principal means of livelihood by working as cultivators or cultivating labourers and not only the small number of people who subsist on agricultural rent, but also the members of their families who are dependent on them for their own subsistence—whether these be non-earning dependents or earning dependents.

Obviously, this is the sort of proportion to which we should pay attention when we seek to measure the extent to which people actually live on agricultural income. But if our objective is to compare cultivation of land with all other industries and services from the point of view of provision of gainful employment—this proportion may or may not serve the purpose. It should serve the purpose if the relative proportions of self-supporting persons, earning dependents and non-earning dependents are identical. But we know they are

not. We know they vary fairly widely between one place and another. Even this would not matter much, if the proportions were the same for the agricultural classes and the non-agricultural classes in the same part of the country. Even this is not the case.

19 We are in a difficulty in deciding what is a good index for the purpose in view, as the following figures for India will show.

TABLE 15

	Number (in lakhs)		Ratio of Agricultural classes to total
	Agricultural classes	Non Agricultural classes	
All persons	2,491	1,075	3,566 69.9
SSPs { Persons	710	334	1,044 68.1
Males	585	287	872 67.1
SSPs { Persons	1,021	402	1,423 71.7
+EDs { Males	690	316	1,006 68.6
SSPs+ { Persons	814	356	1,170 69.5
3EDs { Males	620	297	917 67.6

EDs=Earning dependent.

SSPs=Self-supporting persons.

It is obvious that something can be said in favour of taking anyone of the six percentages which range from 67.1 to 71.7, indicating the extent to which agriculture provides gainful employment (and/or unearned income). It is necessary that this fact should be borne in mind and care taken to make sure precisely what it is that one is comparing. Otherwise the figures are apt to prove discrepant. Such care is especially necessary when comparisons are instituted between the 1951 and 1931 Censuses.

20 We have, so far, considered only the classification of people according to their principal means of livelihood. If this classification is to be correctly appreciated and misconceptions avoided, it is necessary to have some understanding not merely of the concept of 'secondary means of livelihood' but also of the numbers involved. 'Secondary means of livelihood' may mean anyone of two quite different things: First a Self-Supporting person may have, in addition to his principal means of livelihood, a secondary source of income also and this is referred to as 'his secondary means of livelihood'. Again, a person who is not self-supporting may yet have an income if he is an

earning dependent. In that case he—along with non-earning dependents—is affiliated to the person on whom he is dependent, and the latter's principal means of livelihood determines his livelihood classification. But the source of income of the earning dependents (which may or may not be the same) is separately referred to as 'Secondary means of livelihood'.

Detailed tables have been published showing the numbers of persons with secondary means of livelihood, of either type, sub-divided according to the nature of such means of livelihood.

21 The results for India may be stated very briefly as follows:

I—Out of 1,044 lakhs of self-supporting persons in India, 710 lakhs get their principal income from agriculture while the principal income of the other 334 lakhs is non-agricultural. Among them 894 lakhs of people have not returned any secondary means of livelihood. They include 599 lakhs of agriculturists and 295 lakhs of non-agriculturists. There remain 150 lakhs of self-supporting persons who have returned a secondary means of livelihood. They may be sub-divided as shown below:

42 lakhs of agriculturists whose secondary means of livelihood is also agriculture,

70 lakhs of agriculturists whose secondary means of livelihood, is non-agricultural,

25 lakhs of non-agriculturists whose secondary means of livelihood is agriculture, and

13 lakhs of non-agriculturists whose secondary means of livelihood is also non-agricultural.

II—There are, in all, 379 lakhs of earning dependents of whom 311 lakhs are dependent members of the families of agriculturists and 68 lakhs are dependent members of the families of non-agriculturists. We have no information about the nature of the income secured by 10 lakhs, out of the 379 lakhs of

earning dependents. The others are divisible as follows:

TABLE 16

	Earning agricul- tural income	Earning non-agri- cultural income	Total
Dependent members of agri- cultural families	250	52	302
Dependent members of non- agricultural families	21	46	67
TOTAL	271	98	369

22 Unless this background of interrelationship between different types of means of livelihood is borne in mind, one may be easily misled into wrong inferences from a study of census economic data. In particular, this background is necessary for appreciating the difference between the four 'agricultural classes' already mentioned and the different, though closely related, concepts of 'agricultural landholders' and 'landless agriculturists'. It would be wrong to identify Livelihood Class I with the former and livelihood Class III with the latter, though one might easily suppose this to be the natural thing to do.

If we mean by 'an agricultural landholder' every one who has got some permanent right in agricultural land without reference to whether the income therefrom is his principal or secondary means of livelihood or whether he does or does not work on the land, then obviously such persons might be found among any of the four agricultural livelihood classes and also among the non-agricultural classes. Likewise, if we mean by a 'landless agriculturist' every person who is not an agricultural landholder but who, nevertheless, subsists principally either by cultivating rented land or employment as a cultivating labourer, such persons would be found only in Livelihood Class II or III, but would not include all members of these two classes.

As 'landless agriculturist' and 'landholder' figure prominently in current discussions of land reform, a detailed analysis has been made of all self-supporting persons with reference to their secondary means of livelihood and a statement prepared for India, zones and the major states which

shows 'agricultural landholders' separately from 'landless agriculturists' and indicates how the numbers are arrived at. The statement is annexed to this part of the note (*Annexure I*). According to this statement, there are 402 landless agriculturists in India for every 1,000 agricultural landholders. The number varies very widely from 161 in Uttar Pradesh to 782 in Travancore-Cochin.

The figures for zones and major states are given below.

Zones . North India (161), West India (378), East India (444), Central India (445), and South India (625), [North-West India (with 500) cannot be satisfactorily placed because it includes Punjab (with 564) which is affected by a purely temporary aberration.]

Major States Uttar Pradesh (161), Mysore (190), Assam (235), Orissa (271), Bombay (383), Madhya Bharat (397), Madhya Pradesh (413), Hyderabad (507), Bihar (510), Rajasthan (544), West Bengal (609), Madras (714) and Travancore-Cochin (782)

II.—COMPARISON BETWEEN 1951 AND 1931—INDIA

23 The conceptual basis for comparison between the census economic data of 1951 and 1931 was already explained in Part A of this note

With reference to that basis, the relevant data have been assembled in relation to the 1951 boundaries of states. The comparative statement thus prepared is annexed (*Annexure II*).

Use has already been made of the data contained in this statement in order to compare data relating to household economic status and the results were set out in Part B of this note

We now proceed to compare the data so far as they bear on the agricultural class structure

Let us consider first the proportion of the population which subsists on agriculture. At the outset there is the difficulty that the 1931 data furnished only 'earners' who earned any income from certain occupations which can be combined to make up agriculture, 'working dependents' who worked without pay and assisted their families to earn an agricultural income—but not 'non-working dependents' of agriculturists. And we also know that earners and working dependents of 1931 Census are not separately comparable with our self-supporting persons and earning dependents of 1951 Census though, in combination, they are. The best comparison that can be made, on available figures, for India as a whole is shown below

TABLE 17

(NUMBER IN LAKHS)		(NUMBER IN LAKHS)	
1951 CENSUS		1931 CENSUS	
1 All earners	1,035	1 All self-supporting persons	1,044
2 All earners plus working dependents	1,224	2 All self-supporting persons plus earning dependents	1,423
3 Earners with agricultural occupations	680	3 Self-supporting persons in agricultural classes	711
4 All earners and working dependents with agricultural occupations	816	4 All self-supporting persons in agricultural classes, and earning dependents with agricultural income	990
5 (a) Percentage of (3) on (1)	66	5 (a) Percentage of (3) on (1)	68
(b) Percentage of (4) on (2)	67	(b) Percentage of (4) on (2)	70

Note: In this table the 1931 figures of 'earning dependents' show the number of dependent members of all families whose total income was less than 50 lakhs less than all the dependent members of agricultural families who earn less than 50 lakhs.

We may refer to the percentage worked out on item 5 of this table as the agricultural employment percentage (ignoring the fact that a small number of renters would be also included in the figures). The figures show that agricultural employment percentage had changed from 66.67 in 1931 to 68.70 in 1951. Notwithstanding an unavoidable element of uncertainty, this may probably be relied on as evidence that dependence on agriculture for employment did not decrease during these twenty years, but probably increased though to a very small extent only.

24. Out of 1,035 lakhs of earners in 1931 the number of earners who were agricultural renters was 22.20 lakhs. Out of 1,224 lakhs of earners and working dependents, the number of agricultural renters was 24.52 lakhs. The percentage of agricultural renters based on these two factors was thus somewhere between 2.1 and 2.0. The comparison with 1951 works out as follows.

There were 1,044 lakhs of self-supporting persons in the whole of India as at present constituted, and the number of agricultural renters was 16.40 lakhs. The total number of self-supporting persons and earning dependents was 1,423 lakhs out of which those who subsisted on agricultural rent were 19.15 lakhs. The percentage of agricultural renters—based on the two factors,—was thus somewhere between 1.6 and 1.3.

These figures indicate that there has been a fall in the proportion of agricultural renters during the twenty years between 1931 and 1951. Is this fall significant? That is to say, could we be sure that it is not a mere accident of non-comparable classification at the two censuses. If it is significant—what is the significance? Does it mean that agricultural renters have become a definitely smaller percentage of the population? Or does it mean merely that people are now reluctant to acknowledge renter status?

The answer to these questions must necessarily be a matter of opinion. It seems likely that the fall is significant. Even though the figure be very small, the trend is so consistently reflected at zonal, state and divisional level all over India that it cannot be regarded as an accident.

It would not be surprising if it is indeed a fact that the proportion of agricultural renters has become smaller than it used to be. In these

zamindari and other proprietary estates where rent is fixed in money—the income of small proprietors consists partly of such rent and partly of income from cultivation of owned land. The latter being in kind, is likely to have become more valuable relatively, because the price of produce has risen enormously. Again, the members of families of agricultural renters are likely to have better access to educational facilities than other agriculturists, and so there is a better chance of their turning over to non-agricultural avocations when numbers increase and real income decreases.

At the same time, it is also possible that there might have been some reluctance to acknowledge renter status at this census and this may have contributed to the fall to some extent.

It is unnecessary to go further and try to assess the extent of the real fall more precisely because it is clear that the proportion of agricultural renters is, in any case, very small. It is necessary, however, to emphasize the fact that the proportion is small, as this has a bearing on our assessment of the validity of the 1951 figures of owner-cultivators. There can be no basis for any suggestion that these figures were inflated by renters who were anxious to disclaim renter status. The smallness of the overall renter proportion shows that the scope for any such inflation was negligible.

25. We may turn to a comparison between 1931 and 1951 ratio of cultivators to cultivating labourers. We cannot find the exact equivalent in 1931 of an overall ratio, inclusive of non-earning dependents, for there is no affiliation of such dependents to different occupational groups in 1931. There are also a number of other difficulties which will be mentioned presently.

The relevant figures of 1931 are the following, and they relate to the whole of India with the exception of Madhya Bharat and Bhopal.

TABLE 18

	NUMBER (IN LAKHS)
1. Earners in Occupational Groups 5, 6 and 8.	425
2. Earners in Occupational Group 7	213
3. Working dependents in Occupational Groups 5, 6 and 8	73
4. Working dependents in Occupational Group 7	59

Occupational Groups 5, 6 and 8 consist of cultivators. Occupational Group 7 consists of cultivating labourers. 'Earnings' include all self-supporting persons and also those earning dependents who earn any income in cash or kind but exclude all those earning dependents who are unpaid family helpers. In view of this definition the distinction between item 3 and item 4 is unreal. Item 4, like item 3, consists of unpaid family helpers. These cannot be members of families of cultivating labourers because no such member can be unpaid. Therefore items 1, 3 and 4 added together give the total number of members of families of cultivators who worked on cultivation in 1931, including family helpers. Item 2 comprised all members of cultivating labourers families who worked on cultivation. The ratio between cultivators and cultivating labourers in 1931 was therefore 557 213 or 72 : 28.*

26 We have seen already that the ratio of cultivators to cultivating labourers in 1951 for India as a whole was 82 : 18. But this ratio was based not only on self-supporting persons and earning dependents but also non-earning dependents. Therefore it is not the ratio which strictly corresponds to the 1931 ratio of 72 : 28 mentioned above. It might be better compared if we ascertained a ratio after excluding non-earning dependents from the figures of 1951. Here are the figures

TABLE 19

(NUMBER IN LAKHS)

Livelihood Class	Self-supporting persons	Earning dependents	SSP plus E.D.
I	458	214	672
II	88	40	128
Total Cultivators	546	254	800
III Cultivating labourers	149	53	202

From these figures it follows that the ratio of cultivators to cultivating labourers is 80 : 20 (based on self-supporting persons and earning dependents) and 79 : 21 (if based on self-supporting only).

* The figures are corrected to make the necessary correction in the 1931 population of cultivating labourers. The ratio in the 1931 Census is 72 : 28.

It may be deduced that between 1931 and 1951 there has been a significant alteration of the ratio in favour of cultivators as against cultivating labourers and that is measured by the change from 72 : 28 in 1931 to 80 : 20 in 1951.

There is however a complication in that, these ratios are not, even now, entirely comparable. The reason is as follows. In 1931 we took into account those working dependents whose work was classifiable as Occupational Group 5, 6, 7 or 8 without reference to the classification of persons on whom they were dependent. In 1951 we took into account earning dependents of persons whose means of livelihood was classifiable as Livelihood Class I, II or III, without reference to the classification of the work of the earning dependents themselves. Let us see what correction is needed on this account and whether it makes much of a difference. Out of 254 lakhs of earning dependents of cultivators, 208 lakhs work on cultivation and 46 lakhs in other ways. Similarly, out of 53 lakhs of earning dependents of cultivating labourers, 40 lakhs work on cultivation and only 13 lakhs get their income in other ways. If we substitute the smaller for the larger figures in TABLE 17 we find that the ratio of cultivators to cultivating labourers in 1951 is 80 : 20 exactly the same as before. We may, therefore, conclude that between 1931 and 1951, the proportion of cultivating labourers has fallen and the proportion of cultivators has increased significantly in the country as a whole.

27 Given the position that there has been a significant change, what are the possible causes of such a change. Two main causes may be cited as possible which may be referred to briefly as 'transfer' and 'conversion'. When, over a period of 20 years, numbers increase (both among families of cultivators and among families of cultivating labourers), but the cultivated land does not increase in the same proportion—then either the number of workers on the same area of land must get needlessly increased (which is under-employment) or some workers must get 'transferred' from the land to non-agricultural vocations. Whether the one or the other takes place or both in part depends on other conditions—especially the increase of demand for workers in urban industries and services. If conditions are favourable for 'transfer' of some workers, it is reasonable to suppose that it would be the cultivating labourer who would move. The cultivator (who is in most

cases the owner) has the power of decision. If he thinks he no longer needs or can no longer afford to employ a cultivating labourer, the latter has to move. The other factor conversion may arise in two ways. First the people who were genuinely on the border line of cultivators and cultivating labourers may have become cultivators unmistakably. Secondly, cultivators who were not acknowledged as such but were treated as cultivating labourers by the owners of land and who, in the social climate of 1931, were returned, according to the status given to them by owners may have now got their status as cultivator acknowledged in the very different social climate of 1951. It may also be that they have acquired occupancy right by efflux of time under old legislation or by operation of new legislation designed to confer such rights.

A distinction should, however, be noted between the two possible causes. Decline of cultivation *per capita* is a change which has occurred in all parts of the country with negligible exceptions. Normally it should have given rise to some transfer of the cultivating labourer, if in any particular area, it has not led to any transfer, then the absence of such transfer—calls for explanation with reference to circumstances peculiar to the locality. On the other hand 'conversion' is, by its very nature, a local phenomenon. The circumstances in which it could occur on any significant scale are not present in all parts of the country as a general feature of agricultural class-structure.

28 Turning to the ratio of owner-cultivators to tenant-cultivators the figures indicate an enormous change. In 1931 there were 243 lakhs of tenant-cultivator-earners. In 1951 there were 458 lakhs of self-supporting owner-cultivators against only 88 lakhs of self-supporting tenant-cultivators. It is not worth pursuing the reasons for this change, for, as already explained, we know that a great deal of it was due to the fact that, misled by the name tenant, the distinction based on the presence or absence of permanent and heritable rights of occupancy in land was not given effect to in 1931. This is especially noticeable in North India (Uttar Pradesh) where in 1931 only 13 lakhs were classified as owner-cultivators against 98 lakhs of tenant-cultivators. The corresponding figures of 1951 are 114 lakhs and 10 lakhs respectively.

We may conclude our reference to this topic by saying that 1951 figures are not comparable with the 1931 figures in respect of the ratio of owner-cultivators to tenant-cultivators. A comparison between the two is not worth making since it is impossible to disentangle the difference due to real change which must no doubt have occurred during this period from the much greater difference caused by non-comparable classification.

III—COMPARISON BETWEEN 1931 AND 1951—

NORTH INDIA

29 Non-earning dependency

How the population grew in Uttar Pradesh between 1931 and 1951 and how the growth was reflected in villages and towns and in the three household economic status groups might be seen from the table below—

TABLE 20

(NUMBER IN LAKHS)

	1931	1951	Increase+ Decrease—
1 General population	498	632	+134
2 Rural population	442	546	+104
3 Urban population	56	86	+30
4 Earners/SSPs	207	193	—14
5 W Ds/EDs	34	76	+42
6 NWDs/NEDs	257	363	+106
7 Earners+W Ds/SSPs+EDs	241	269	+28

The disproportionate growth of non-earning dependents is clear. They had grown by 106 lakhs which is larger than the entire increase which took place in the—rural population. The gainfully occupied persons on the other hand, had increased by only 28 lakhs, which is rather less than the entire increase which took place in the urban population.

30 Relative weight of dependence on agriculture

The extent to which agricultural and non-agricultural avocations provided means of

WD—Working dependent, ED—Earning dependent, NWD—Non-Working dependent, NED—Non earning dependent, SSP—Self Supporting Person

livelihood is shown in the table below for 1931 and 1951 :

TABLE 21

(NUMBER IN LAKHS)

		1931	1951	Increase+ Decrease-
Earners/SSPs	{ Agricultural	146	139	-7
	{ Non-agricultural	61	54	-7
WDs/EDs	{ Agricultural	30	63	+33
	{ Non-agricultural	4	13	+9
Earners+WDs/SSPs+EDs	{ Agricultural	176	202	+26
	{ Non-agricultural	65	67	+2

These figures indicate a rise in the agricultural employment percentage as follows: 1931—from 71 to 73 and 1951—72 to 75. These figures make it clear that during the twenty years 1931-50 there has been no reduction but on the contrary a small—but probably not insignificant—increase in the relative weight of dependence on agriculture as the means of livelihood of the people of Uttar Pradesh.

31. Cultivators and cultivating-labourers :

Changes in the numbers of cultivators and cultivating labourers are shown below:

TABLE 22

(NUMBER IN LAKHS)

		1931	1951	Increase+ Decrease-
Earners/SSPs	{ Cultivators	111	123	+12
	{ Cultivating labourers	31	13	-18
WDs/EDs	{ Cultivators	27	56	+29
	{ Cultivating labourers	3	7	+4
Earners+WDs/SSPs+EDs	{ Cultivators and Cultivating labourers	172	199	+27

While the total number of workers in cultivation has increased by 27 lakhs, there is an increase of cultivators by 41 lakhs and an absolute decrease of labourers by 14 lakhs. This requires explanation.

32. The first step is to adjust for non-comparable classification of working dependents classified as cultivating labourers in 1931, who must be members of cultivator families. The result of this adjustment is shown below.

TABLE 23

(NUMBER IN LAKHS)

		1931	1951	Increase+ Decrease-
Total number of workers in cultivation (including unpaid family helpers)				
1	Cultivators	141	179	+38
2	Cultivating labourers	31	20	-11
	Total	172	199	+27

Out of every 100 workers in cultivation (including unpaid family helpers) 82 belonged to families of cultivators while 18 belonged to families of cultivating labourers. These numbers changed to 90 and 10 in 1951. It is this change which needs explanation.

33. Cultivated acreages:

On an average of 5 years preceding 1931 the cultivated acreage in Uttar Pradesh was 348 lakhs of acres; 172 lakhs of people worked on this land. Thus every 100 cultivated acres gave employment to 49 workers in 1931. On an average of 5 years preceding 1951, the cultivated acreage had increased to 393 lakhs of acres with 199 lakhs of people working on them. One hundred cultivated acres thus gave employment to 51 workers in 1951. The increase in numbers working on the same unit of land was relatively small.

Given the position that the increase of cultivated acreage was such as to limit the provision of gainful employment to 199 lakhs of people, we have to see why the number got divided into 179 lakhs and 20 lakhs. We note that there were 141 lakhs of

workers of cultivating families in 1931. Assuming that they increased in number at the same rate as the general population, they would have grown to 179 lakhs in 1951 which is identical with the number in 1951 census. If we may suppose that the proportion of workers in the families of cultivators of Uttar Pradesh continued to be the same in 1951 as in 1931, it would follow that the whole of this number, 179 lakhs would have been first employed and the cultivators would have reduced the number of cultivating labourers employed by them to the balance number needed viz., 19 lakhs. This would account completely for the reduction which actually occurred among cultivating labourers.

34. The figures indicate that some other factor was also at work, tending to diminish the number of cultivating labourers. The Superintendent of Census Operations of Uttar Pradesh reports that "many persons who were formerly treated only as labourers, even though they were cultivating the *sr* or *khud-kasht* of zamindars, have now succeeded, as a result of legislation and administrative measures, in getting themselves recorded as cultivators of the land in their cultivating possession." He refers to a "remarkable fall in the figure of cultivating labourer in the Central Plain division" and says it is "due to the fact that owing to land reform legislation many of the former labourers have been converted into cultivators in the *tahsildari* districts of Oudh".

35. If the foregoing account of the changes which took place between 1931 and 1951 is to be accepted, it is necessary to form an idea about what happened to the natural increase among cultivating labourers. Between 1931 and 1951, the urban population of Uttar Pradesh increased by 30 lakhs of which it is clear that about one half or 15 lakhs must be due to migration from villages. It would seem that this migration must have been highly selective and operated as the outlet for the natural increase of cultivating labourer families.

The numbers involved are, however, such as to suggest that this cannot be the complete explanation. The 'conversion' mentioned in the foregoing paragraph must have been a significant factor and accounted for perhaps about 6 lakhs.

36. To sum up, it seems to be a fact that the relative proportion of cultivators to cultivating labourers changed in Uttar Pradesh from 82.18 in 1931 to 90.10 in 1951.

The reasons for this change may be stated as follows. There was a moderate amount of decline in the area of cultivated land *per capita*. This did not, however, lead to any very sizable increase in the number of people working on the same area of cultivated land. As, however, there were increased numbers of workers available in the families of cultivators, fewer labourers were needed and could be paid for. This was the main reason for the fall in the proportion of cultivating labourers. But it is not sufficient to explain the fall completely. Another important reason was the 'conversion' of former labourers into cultivators. This occurred mainly among people who worked on *sr* and *khud-kasht* lands of zamindars.

IV—COMPARISON BETWEEN 1931 AND 1951—

EAST INDIA

37. Non-Earning Dependency (Zone)

The general population of East India increased from 700 lakhs in 1931 to 901 lakhs in 1951. At the same time the rural and urban population as well as the three household economic status groups increased as shown below:

TABLE 24

(NUMBER IN LAKHS)

	1931	1951	Increase+ Decrease—
1. General population .	700	901	+201
2. Rural population .	651	801	+150
3. Urban population .	49	100	+51
4. Earners/SSPs .	260	277	+17
5. W Ds/EDs .	26	54	+28
6. NWDs/NEDs .	414	570	+156
7. Earners+W Ds/SSPs+ EDs .	286	331	+45

WD—Working dependent, ED—Earning dependent, NWD—Non-Working dependent, NED—Non-earning dependent, SSP—Self-Supporting person.

The figures show that non-earning dependents have increased disproportionately. The increase is 156 lakhs which exceeds the entire increase of the rural population. The number of gainfully occupied persons (including earning dependents) has increased by 45 lakhs which is somewhat less than the entire increase of urban population.

38 Non-earning dependency (States) :

How these changes occurred in each of the four major States of this zone may be seen from the table below

TABLE 25
(NUMBER IN LAKHS)

	Growth of Rural popula- tion (1931- 50)	Growth of NWDs/ NEDs (1931- 50)	Percentage of NWDs/NEDs	
			1931	1951
Bihar	64	69	59	64
Orissa	20	22	55	62
West Bengal	38	46	66	65
Assam	25	19	52	57

These figures show that Bihar, Orissa and Assam reproduce individually the same features as were already observed in India, North India and East India, viz., a disproportionate increase in the percentage of non-earning dependents. West Bengal, it will be noticed, does not repeat this trend. Here too non-earning dependents have increased in number, but not excessively. On the contrary, there is a drop in the percentage from 66 in 1931 to 65 in 1951. What does this signify? It is difficult to be sure of the right answer. The following comments are made:

First.—It is to be observed that there has been a strikingly large growth of urban population within these twenty years. It has grown, in fact, from 28 lakhs to 62 lakhs. There is no other major State in India—not even Bombay—where the growth of urban population is proportionately as large. It is true that part of this growth must have been

due to inflow of migrants from outside the State. Nevertheless, it is probable that this growth provided more adequate opportunity than the other States for absorption in gainful employment of the natural increase occurring in villages, and

Secondly.—It is to be noticed that even after reduction, the percentage of non-earning dependency in West Bengal is still very high—(65). This makes it easier to accept the view that a genuine reversal of trend did probably occur during the last twenty years, as a result of the growth of Greater Calcutta.

39 Relative weight of dependence on agriculture (Zone):

The break-up of the number of self-supporting persons and earning dependents of East India by agricultural and non-agricultural classes is shown below:

TABLE 26
(NUMBER IN LAKHS)

		1931	1951	Increase+ Decrease—
Earnings/SSPs	{ Agricultural	183	199	+16
	{ Non-agricultural	77	78	+1
WDs/EDs	{ Agricultural	13	31	+18
	{ Non-agricultural	13	23	+10
Earnings+WDs/ SSPs+E.Ds	{ Agricultural	196	230	+34
	{ Non-agricultural	90	101	+11

The relative weight of dependence on agriculture in 1931 was 71, reckoned on earners only and 69 when reckoned on earners and working dependents jointly. The corresponding figures in 1951 were 72 and 70 respectively. The figures are inconclusive on the issue whether or not the weight of dependence on agriculture has increased.

40 *Relative weight of dependence on agriculture (States)*

To what extent are these features reproduced in the major States of this zone? This is shown in the table below.

TABLE 27

	1931	1951
Bihar . . .	77	87 to 84
Orissa . . .	68 to 64	77 to 70
West Bengal . .	60 to 57	47 to 48
Assam . . .	61 to 60	62 to 64

The result is interesting. It is seen that the apparently inconclusive result for the zone as a whole, is the resultant of quite significant but contradictory movements in West Bengal and the other States of this zone.

The increases in Bihar, Orissa and Assam are of the same pattern as already observed for India as a whole and for Uttar Pradesh. West Bengal alone shows a sharp diminution. This is clearly connected with the phenomenon of reduction of non-earning dependency in that State.

41 *Cultivators and Cultivating Labourers (Zone)*

In East India the numbers of cultivators and cultivating labourers compare with one another in 1931 as well as 1951 as shown below.

TABLE 28

(NUMBER IN LAKHS)

		1931	1951	Increase+ Decrease—
Earnings/SSPs	Cultivators	127	151	+24
	Cultivating labourers	52	46	—6
W Ds/E Ds	Cultivators	5	18	+13
	Cultivating labourers	8	13	+5
Earnings+WDs/ SSPs+E Ds	Cultivators and Cultivating labourers	192	228	+36

After adjusting for non-comparable classification of Working dependents and cultivating labourers in 1931, the combined results are shown below.

TABLE 29

(NUMBER IN LAKHS)

	1931	1951	Increase+ Decrease—
Total number of workers in cultivation (including unpaid family helpers)			
1 Cultivators . . .	140	169	+29
2 Cultivating labourers	52	59	+7
Total . . .	192	228	+36

The ratio between cultivators and cultivating labourers had been 73 : 27 in 1931 and thus had changed to 74 : 26 in 1951. There is a very small decline in the proportion of cultivating labourers and likewise a small increase in the proportion of cultivators.

42. *Cultivators and Cultivating Labourers (States).*

We may first note how this trend is reproduced in the major States of this zone.

TABLE 30

	Ratio of cultivators to cultivating labourers (including unpaid family helpers)	
	1931	1951
Bihar . . .	73 : 27	72 : 28
Orissa . . .	68 : 32	74 : 26
West Bengal . .	60 : 40	68 : 32
Assam . . .	68 : 2	65 : 5

The figures indicate very striking differences in the different States. In Bihar there is practically no change in relative numbers. West Bengal appears to have had the highest proportion of

cultivating labourers in the zone but it has declined sharply during these 20 years and is now not much higher than in Bihar. The ratio in Orissa was intermediate between West Bengal and Bihar in 1931. The proportion of cultivating labourers has fallen. It is now distinctly lower than in both Bihar and West Bengal.

Assam is entirely different from the other three States. The proportion of cultivating labourers remains negligible presumably because land has been available for all who were prepared to work on it.

43. Cultivated acreages:

All the four States possess statistics of cultivated acreages. But the returns are not based on field inspection by responsible staff. They cannot be accepted as the basis for serious analysis unless the inferences drawn from them are corroborated by other evidence. Among these figures those of West Bengal, which purport to evidence a growth of cultivated acreages from 74 lakhs to 109 lakhs, are definitely known to be incorrect because a change in the basis of estimation was effected in 1943 which had the effect of raising the pre-existing rice acreage by nearly 20 per cent. We may infer from the consistent trend of the figures of other States, that the rate of the growth of cultivation during these 20 years has fallen short of the rate of growth of population.

The figures for the other major States (given below), show much the same features as in Uttar Pradesh:

TABLE 31

	Number of workers per 100 cultivated acres	
	1931	1951
Bihar	50	52
Orissa	29	32
Assam	46	48

The increase in the number of workers per 100 cultivated acres was proportionately larger in Orissa than in Bihar or Assam. Assam as already noted, has so few cultivating labourers that the figures call for no comments. The reduction that has occurred in the proportion of cultivat-

ing labourers is intelligible for reasons discussed in respect of Uttar Pradesh. What is not clear in the light of all this, is why the Bihar proportion, of cultivating labourers remains practically the same in 1951 as in 1931. Could it be because the decline of area of cultivated land *per capita* was less sharp in Bihar than in Uttar Pradesh? The figures indicate a drop of 6 cents—from 63 cents to 57 cents—in Bihar; while in Uttar Pradesh it fell by 10 cents—from 72 cents to 62 cents. In Orissa the decline was even sharper. This must be one of the reasons for the difference but might not be the only one. More research is needed before the matter can be cleared up.

V—COMPARISON BETWEEN 1931 AND 1951—

SOUTH INDIA

44. *Non-earning dependency (Zone)* . The general population of South India increased from 577 lakhs in 1931 to 756 in 1951. How much of this increase took place in the rural population and in the urban population as well as the three household economic status groups is shown below .

TABLE 32

(NUMBER IN LAKHS)

	1931		Increase + Decrease
	1931	1951	
1. General Population .	577	756	+179
2. Rural Population . .	495	607	+112
3. Urban Population . .	82	149	+67
4. Earners/ESSPs . . .	215	201	-14
5. WDs/EDs	26	37	+11
6. NWDs/NEDs	336	518	+182
7. Earners + WDs/SSPs + EDs	241	238	-3

The figures present a surprise in that the entire increase of population seems to be balanced by an equal increase of non-earning dependents. The total number of persons who were gainfully occupied would appear to have been practically stationary during the twenty years.

45 *Non-Earning dependency (States)*: How do the major States of this zone fare in this respect? This is shown below.

TABLE 33
(NUMBER IN LAKHS)

	Growth of general popula- tion (1931- 50)	Growth of NWDs/ NEDs (1931- 50)	Percentage of NWDs/NEDs	
			1931	1951
Madras	124	133	58.3	69.1
Mysore	25	28	54.5	70.6
Travancore-Cochin	30	20	62.9	63.8

This increase of non-earning dependency was small in Travancore-Cochin but then it had already reached a high figure in that State in 1931. The other two States both show very large increases. These are not due to any disproportionate increase of women and children in the population. Thus, in Madras the people under age 15 dropped from 39 per cent in 1931 to 36 per cent in 1951, while among people aged 15 and over women were 51 per cent in 1931 and 50 per cent in 1951.

It is difficult to attribute these increases to errors in classification for Madras and Mysore are among the best equipped with village staff. It is also not very probable that the same kind of error should have independently appeared in both States. Further, it has been observed by the Superintendent of Census Operations, Madras that the variations of the household economic status pattern among the different divisions and districts of Madras present a consistent and intelligible picture. The theory of error is not, therefore, tenable. There are quite a number of indications which consistently point to South India as least provided with gainful occupation among all the zones in India. But this very large increase makes one wonder whether it may not (in part at any rate) reflect the effect of an unusually prolonged succession of unfavourable seasons which preceded 1951.

46. *Relative weight of dependence on agriculture (Zone)*: Separate figures for agricultural and

non-agricultural classes are furnished and compared in the table below.

TABLE 34
(NUMBER IN LAKHS)

		1931	1951	Increase+ Decrease-
Earnings/SSPs	{ Agricultural	128	126	-2
	{ Non-agricultural	87	75	-12
WDs/EDs	{ Agricultural	16	20	+4
	{ Non-agricultural	10	17	+7
Earnings+WDs/ SSPs+EDs	{ Agricultural	144	146	+2
	{ Non-agricultural	97	92	-5

The relative weight of dependence on agriculture was between 59 per cent and 60 per cent in 1931. In 1951 it was between 63 per cent and 61 per cent. There was thus a significant though small increase.

47. *Relative weight of dependence on agriculture (States)*. Similar figures for the major States of this zone are shown below.

TABLE 35

	1931	1951
Madras	59 to 60	64 to 63
Mysore	69 to 71	68 to 65
Travancore-Cochin	48 to 45	51 to 49

The figures show that dependence on agriculture has definitely increased by nearly 4 per cent in Madras. It has definitely decreased in Mysore, though there is room for much uncertainty about the true extent of this decrease. In Travancore-Cochin it has almost certainly increased, though, here again, the extent of the increase is uncertain.

48 Cultivators and Cultivating labourers (Zone)

The number of cultivators and cultivating labourers are compared below.

TABLE 36
(NUMBER IN LAKHS)

		1931	1951	Increase+ Decrease—
Earnings/SSPs	Cultivators	75	81	+6
	Cultivating labourers	47	40	-7
WDs/EDs	Cultivators	6	5	-1
	Cultivating labourers	9	14	+5
Earnings+WDs/SSPs+EDs	Cultivators and Cultivating labourers	137	140	+3

After reclassifying the working dependents of cultivating labourers of 1931, we get the following results.

TABLE 37
(NUMBER IN LAKHS)

	1931	1951	Increase+ Decrease—
Total number of workers in cultivation (including unpaid family helpers)			
Cultivators	90	86	-4
Cultivating labourers	47	54	+7
Total	137	140	+3

The figures show that there has been a definite change. The ratio of cultivators to cultivating labourers was 66.34 in 1931 and 61.39 in 1951. Thus the zone as a whole reproduces the Bihar pattern in this respect and differs from the pattern of Uttar Pradesh.

49 Cultivators and Cultivating labourers (States).

The ratio for each of the three states has been worked out separately and they are shown below.

TABLE 38

	Ratio of cultivators to cultivating labourers (including unpaid family helpers)	
	1931	1951
Madras	62.38	60.40
Mysore	87.13	84.16
Travancore-Cochin	66.34	50.50

These figures show a small increase in the proportion of Cultivating Labourers in Madras, as well as in Mysore, and a fairly substantial increase in Travancore-Cochin. Why it should have occurred is a puzzling question which needs further research for answer.

50 Cultivated acreages. The figures of cultivated acreages are available for all three States and those of Madras and Mysore are among the most reliable in India. They are shown below.

TABLE 39

	Cultivated acreages—average of 5 years (IN LAKHS)		Number of workers per 100 cultivated acres	
	1931	1951	1931	1951
Madras	320	310	34	36
Mysore	65	63	32	26
Travancore-Cochin	26	28	41	57

In Madras and Mysore, the cultivated acreage had been stationary for a long time, and registered a small decrease because of an unusually prolonged succession of unfavourable seasons before the 1951 Census. In Travancore-Cochin, the 1931 level of cultivated acreage was

increased by 11 per cent while the 1931 population increased by 47 per cent. In the result the area of cultivated land *per capita* declined heavily in all three States *viz.*, from 72 to 54 cents in Madras, 99 to 70 cents in Mysore, and from 40 to 30 cents in Travancore-Cochin.

The reaction to this decline has been materially different in the three States. In Madras, the main result has been a large increase of the percentage of non-earning dependency of the general population, a small increase in the number of workers for 100 acres of cultivated land *plus* a small increase of cultivating labourers relatively to cultivators.

In Mysore, the main result has been an even larger increase than in Madras of the percentage of non-earning dependency of the general population. At the same time, however, the number of workers per 100 acres of cultivated land has diminished.

In Travancore-Cochin, non-earning dependency of the general population had already reached a high level in 1931 and though a further increase took place during 1931-50, it was quite small. The main reaction to decline of the area of cultivated land *per capita* has been a quite substantial rise in the number of workers per 100 acres of cultivated land, and this increased number consists of a large number of cultivating labourers relatively to cultivators than in 1931. There seems to be little reason for doubting

that the differences observable between South India and other zones so far considered must be related to the fact that the decline of the area of cultivated land *per capita* has been much sharper in South India than in North India or East India. There are differences in the reactions of different parts of South India. Each is intelligible in its way—but why one part should react in one way and another part in another way, is an interesting question which cannot be answered without much closer study and local investigation.

One type of explanation which lies on the surface may be mentioned. The figures of TABLE 35 make it clear that Mysore is distinguished from other parts of India by the fact that non-agricultural employment has developed to a greater extent during the last 20 years. This must have had its effect in attracting labour away from the land and thus causing the fall in the number of workers per 100 cultivated acres.

VI—COMPARISON BETWEEN 1931 AND 1951—

WEST INDIA

51 *Non-earning dependency.*

The general population of West India increased from 287 lakhs in 1931 to 407 lakhs in 1951. The break up of this increase by growth of rural and urban population as well as by the different household economic status groups is shown for 1931 and 1951 separately in the table below.

TABLE 40

(NUMBER IN LAKHS)

	1931	1951	Increase + Decrease—
1 General Population	287	407	+120
2 Rural Population	224	280	+ 56
3 Urban Population	63	127	+ 64
4 Earners/SSPs	94	109	+ 15
5 WDs/EDs	22	64	+ 42
6 NWDs/NEDs	171	234	+ 63
7 Earners + WDs/SSPs + EDs	116	173	+ 57

West India, according to these figures, presents a very different picture from the other Zones. In the first place the increase in the urban population (which has doubled itself) had been even larger than the increase of rural population notwithstanding that the percentage increase of rural population is as high as 25.1 per cent (as against India's 21.9 per cent). Plainly, the urban growth has been brought about by an influx of migrants from outside the Zone—(an inference which is corroborated by other considerations as well).

Then we note that the growth in the number of non-earning dependents is little more than one-half of the total increase of population. The percentage of non-earning dependents, has therefore, decreased from 59.6 per cent to 57.5 per cent.

The figures for Bombay reproduce the foregoing features of West India (which includes, in addition, Saurashtra and Kutch). The urban population of Bombay has increased by 58 lakhs, while the rural population increased by 50 lakhs. Non-earning dependents have increased by 57 lakhs. The percentage of Non-earning dependents to the general population has decreased from 59.2 per cent in 1931 to 57.2 per cent in 1951.

In this context, it should be added that there was practically no change in the age-sex-structure of Bombay. People below age 15 numbered about 40 per cent both in 1931 and 1951. Among those aged 15 and over, women were 48 per cent both in 1931 and 1951.

52. Relative weight of dependence on agriculture.

The break up of the numbers of self-supporting persons and earning dependents into corresponding segments of agricultural and non-agricultural

classes is shown below and compared between 1931 and 1951 :

TABLE 41
(NUMBER IN LAKHS)

		1931	1951	Increase+ Decrease—
Earnings/SSPs	{ Agricultural	58	59	+ 1
	{ Non-agricultural	36	50	+ 14
WDs/EDs	{ Agricultural	16	51	+ 35
	{ Non-agricultural	6	13	+ 7
Earnings+WDs SSPs+EDs	{ Agricultural	74	110	+ 36
	{ Non-agricultural	42	63	+ 21

The agricultural employment percentage may be estimated as lying between 61.7 per cent and 63.8 per cent in 1931, while the corresponding figures for 1951 are 54.1 per cent and 63.6 per cent.

The relevant figures limited to Bombay State alone are as follows. The value for 1931 lies between 63.2 and 65.3; while the value for 1951 lies between 55.5 and 64.6. The figures suggest that in Bombay State, and in West India as a whole there probably was some reduction in the dependence on agriculture; but it is not possible to be certain on the point, because the numbers of unpaid family helpers are large and the nature and extent of their contribution are necessarily uncertain.

53. Cultivators and cultivating labourers :

The relevant comparison is exhibited side by side for West India as a whole and Bombay state separately :

TABLE 42

		(NUMBER IN LAKHS)					
		West India			Bombay		
		1931	1951	Increase+ Decrease—	1931	1951	Increase+ Decrease—
Earnings/SSPs	{ Cultivators	27	47	+20	24	42	+18
	{ Cultivating Labourers	29	11	—18	28	10	—18
WDs/EDs	{ Cultivators	4	31	+27	3	28	+25
	{ Cultivating Labourers	12	19	+7	10	17	+7
Earnings+WDs/ SSPs+EDs	{ Cultivators and	72	108	+36	65	97	+32
	{ Cultivating Labourers						

We should, as explained before, reclassify the working dependents of Cultivating labourers of

1931 and recombine the figures They yield the following results :

TABLE 43

(NUMBER IN LAKHS)

	West India			Bombay		
	1931	1951	Increase + Decrease—	1931	1951	Increase + Decrease—
Total number of workers in cultivation (including unpaid family helpers):						
Cultivators . . .	43	78	+35	37	70	+33
Cultivating labourers . . .	29	30	+1	28	27	—1
Total . . .	72	108	+36	65	97	+32

The figures make it clear that (even after allowance is made for non-comparable classification) there has been relatively a reduction in the number of cultivating labourers in west India as well as in Bombay alone. The ratio between cultivators and cultivating labourers has fallen in Bombay from 57.43 in 1931 to 72.28 in 1951.

54 Cultivated acreages :

Bombay has excellent statistics of cultivation. Unfortunately these were somewhat marred shortly before 1951 by the inclusion in almost every district of a large number former princely States which had no statistics at all or only very poor statistics. It is possible, however, to make allowance for this fact and conclude without any doubt that cultivation did not keep pace with increase of population. Whereas the area of cultivated land per capita was 1.56 acres in 1931, it had declined to 1.18 acres in 1951.

Let us consider 1,000 persons of the general population in Bombay in 1931. They included $\frac{1000 \times 65}{252}$ or 258 persons working in cultivation—whether as cultivators, cultivating labourers, earners or working dependents; and they had $1,000 \times 1.56 = 1560$ acres to cultivate. Thus 100 acres of cultivation gave employment in 1931 to 17 persons. By 1951, the 1,000 persons of 1931 had increased to 1,425 persons. They included $\frac{1,425 \times 97}{360}$ or 384

persons working in cultivation. They cultivated $1,425 \times 1.18$ or 1,682 acres. Thus, in 1951 100 acres of cultivated land gave employment to 23 persons.

It is fairly certain that the 23 persons of 1951 who worked the same 100 acres as 17 persons in 1931 were less fully employed. From this it would seem to be natural that the cultivators of 1951 must have used unpaid family helpers to a much larger extent than their fathers in 1931, and that the opportunities for employment available to the increased number of cultivating labourers diminished correspondingly.

While this explanation seems to be natural and credible, it raises two questions. First, is it the only explanation for the drop in the number of cultivating labourers? Secondly, why did not such a drop occur in Bihar? These are difficult questions to which conclusive answers cannot be furnished without further study supplemented by local enquiries. The answers which may be advanced as working hypotheses on the basis of the present review are as follows :

First.—The drop in the number of cultivating labourers cannot be wholly explained by the fact that the natural increase of cultivators and the members of their families outran the increase in the area of cultivated land. It seems almost certain that a 'conversion' phenomenon was at work. Though Bombay is mainly riyawari there are parts of the State where minor

tenures exist which involve ambiguous relations between the landholder and cultivator. There has been tenancy legislation designed to confer security of tenure on the latter. It is, therefore, not merely possible but probable that some of the 'labourers' of 1931 were even then *de facto* cultivators, but described as labourers in order to discourage claims for occupancy right. Further 'coversions' might have taken place as a result of the general social trend and tenancy legislation. Ambiguous relations of this type are not necessarily confined to landholders and cultivators. They might also have prevailed in 1931, as between creditors and indebted cultivators. If such a state of affairs had existed, it would have been greatly changed during the decade of high prices which preceded 1951.

Secondly,—The differences between Bombay and Uttar Pradesh on the one hand and Bihar on the other, are probably attributable to one or other or both of two factors. The extent to which non-agricultural employment was increasing and attracting workers from families of cultivating labourers away from the land must have made a considerable difference. Where this attraction existed, wages would have risen to a point at which—even at the high level of prices—the cultivators with diminished holdings would have found it difficult to employ labour on the same scale as before. It is quite likely that this outlet for landless labour was more effective in Bombay than in Uttar Pradesh and much more effective in these two States than in Bihar.

Thirdly,—while such economic considerations are important, social factors must also have played their part. The extent to which social habits and customs permit women of cultivator families to work in the fields probably varies very considerably and might have undergone changes during the last 20 years. This is an elusive aspect of the problem which has to be constantly borne in mind.

Fourthly,—the possibility has been suggested that 'category climbing' in Bombay might have diminished the numbers of cultivating labourers in 1951. The scope for such category-climbing was, indeed, somewhat larger in Bombay than in the country as a whole. Out of 34 lakhs of self-supporting owner-cultivators in Bombay, 3 lakhs returned employment as cultivating

labourer or cultivating rented land as secondary means of livelihood. The corresponding figures for the country as a whole were 458 lakhs and 32 lakhs respectively. Even so, the numbers involved in 'category-climbing' in 1951 are too small to account for any very large part of the observed decrease. The position would be different if we might suppose that 'category climbing' could have attained the point of actual suppression of the status of labourer even as secondary occupation, but there is no good reason in support of such a supposition.

VII.—COMPARISON BETWEEN 1931 AND 1951—

CENTRAL INDIA

55. *Non-Earning dependency (Zone)* The general population of Central India increased from 422 lakhs in 1931 to 523 in 1951. How this increase compared with the increase, separately, of the rural and urban population and of the three household economic status groups is shown below.

TABLE 44

(NUMBER IN LAKHS)

				Increase+
		1931	1951	Decrease—
1. General Population	.	422	523	+101
2. Rural Population	.	377	440	+63
3. Urban Population	.	45	83	+38
4. Earnings/SSPs		169	152	—17
5. WDs/EDs	.	47	104	+57
6. NWDs/NEDs	.	206	267	+61
7. Earnings+WDs/SSPs+EDs		216	256	+40

The pattern of growth is much the same as in India as a whole and in North India. Non-earning dependents have increased from 49 per cent in 1931 to 51 per cent in 1951.

56. Non-Earning dependency (States) :

How the different major states of this zone fared are shown below

TABLE 45

(NUMBER IN LAKHS)

	Growth of rural Popu- lation (1931-50)	Growth of NEDs (1931-50)	Percentage of NEDs/NEDs 1931 1951	
Madhya Pradesh	23	11	47	44
Madhya Bharat	10	15	50.1	58 7
Hyderabad	24	25	52.8	54 3

The figures draw attention to the exceptionally low level of non-earning dependency in Madhya Pradesh. The 1951 figure is so low in comparison with other states that, if it stood alone, one is almost certain to surmise that some sort of error had been committed whereby people who should have been classed as non-earning dependents, were classed as 'earning dependents' which is the exact opposite of the surmise about Madras and Mysore. Such a surmise is discouraged immediately, not only by the fact that Madhya Pradesh is also one among the states which are well equipped with *Patwari* Staff and subordinate rural administrative staff but by an even more important fact, *viz*, that the 1931 figures reflect the same phenomenon in an unmistakable manner. It does seem, therefore, likely that the participation of women in gainful work generally and particularly in the cultivation of family holdings in Madhya Pradesh is perhaps the highest in India. Why this should be so, is a matter for study of differences in social habits and customs. But the fact itself seems to be clearly established by all available data.

The figures of Hyderabad are normal, both in respect of the extent of increase which took place during 1931-50 as well as its absolute size. But Madhya Bharat is somewhat puzzling, because

non-earning dependency has risen very sharply—the rise is comparable to that already observed in Madras.

57. Relative weight of dependence on agriculture (Zone)

The relevant figures are furnished below

TABLE 46

(NUMBER IN LAKHS)

		1931	1951	Increase+ Decrease—
Earnings/S S Ps	Agricultural	113	110	—3
	Non-agricultural	56	42	—14
W Ds/E Ds	Agricultural	33	85	+52
	Non-agricultural	14	19	+5
Earnings+W Ds/ S S Ps+B Ds	Agricultural	146	195	+49
	Non-agricultural	70	61	—9

Agricultural Employment Percentage was 67 in 1931 and had risen from 72 to 76 in 1951

58. Relative weight of dependence on agriculture (State) :

The following table shows the changes in the two major states of this zone for which figures are available for 1931 as well as 1951

TABLE 47

	1931	1951
Madhya Pradesh	76 to 78	75 to 79
Hyderabad	50 to 49	65 to 71

From these figures it would appear that, so far as Madhya Pradesh is concerned it is doubtful whether there has been an increase of dependence. If there was, it was almost certainly very small. There is a large increase of agricultural employment percentage in Hyderabad. It may be that the increase of Hyderabad is real, following the pattern of Madras and Mysore. The possibility cannot be ruled out that there might have been some error in the low 1931 figures for Hyderabad.

59 Cultivators and Cultivating labourers (Zone)

The number of cultivators and cultivating labourers are compared in the table below for 1931 and 1951.

TABLE 48

		(NUMBER IN LAKHS)		
		1931	1951	Increase + Decrease -
Eamers/S S Ps.	Cultivators	56	74	+ 18
	Cultivating Labourers	52	33	- 19
WDs/EDs	Cultivators	20	19	- 1
	Cultivating Labourers	11	66	+55

Eamers + WDs/ S S Ps + EDs	Cultivators and Cultivating Labourers	139	192	+53
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After reclassifying the working dependents as cultivating labourers in 1931, we have the following results :

TABLE 49

		(NUMBER IN LAKHS)		
		1931	1951	Increase + Decrease -
Total number of workers in cultivation (including unpaid family helpers) :				
Cultivators		87	93	+6
Cultivating Labourers		52	99	+47
Total		139	192	+53

The ratio was 63.37 in 1931. It changed by 1951 to 48.52

60 Cultivators and Cultivating labourers (States):

The ratios for the two major states for which figures are available are shown below :

TABLE 50

		Ratio of cultivators to cultivating labourers (including unpaid family helpers)	
		1931	1951
Madhya Pradesh		57.43	42.58
Hyderabad		67.33	44.56

It is observed that the relative numbers of cultivating labourers increased in Madhya Pradesh as well as in Hyderabad.

61 Cultivated acreages :

It is reliably known that in Madhya Pradesh cultivated acreage was practically stationary between 1931 and 1951. Let us consider 1,000 persons in 1931. They included 416 workers in cultivation (this includes cultivators and cultivating labourers and earners as well as working dependents). They cultivated 1,610 acres of land. In 1951, the 1,000 persons had increased to 1,196. They included 524 workers in cultivation who cultivated the same 1,610 acres. The result is that the number of workers per 100 acres of cultivated land increased from 26 in 1931 to 33 in 1951.

In the aggregate, therefore, the same land is giving employment to the original number of workers as well as the natural increase in these numbers, and in fact some more. In these circumstances why should the proportion of cultivating labourers increase and the proportion of cultivating labourers diminish. It seems likely that the two causes noticed in Uttar Pradesh must have been both operative, but their relative importance must have been reversed. To some extent the natural increase in the families of smaller cultivators must have thrown cultivating labourers out of employment. To an even larger extent, however, the process of 'conversion' of cultivating labourers into cultivators of 'unowned land' (if not of owned land) must have gone on throughout the twenty year period. The *malguzari* tenure of this state had kept in being a relatively larger proportion of proprietors of states who carried on direct cultivation than under the main zamindari states (whether permanently settled as in East India and parts of South India or temporarily settled as in North India). It seems probable that there was even greater scope for the 'conversion' process in Madhya Pradesh than in Uttar Pradesh. There was possibly also greater need, since urbanisation was not providing an outlet for landless labour to anything like the same extent as in Uttar Pradesh.

VIII.—COMPARISON BETWEEN 1931 AND 1951—

(NORTH-WEST INDIA)

62. *Non-earning dependency (Zones & States) :* The general population of North-West India increased from 270 lakhs in 1931 to 350 lakhs in 1951. The growth in villages and towns as

well as in the three different household economic status groups may be seen from the table* below.

TABLE 51

(NUMBER IN LAKHS)

	1931	1951	Increase + Decrease—
1 General Population	270	350	+80
2. Rural Population	230	275	+45
3 Urban Population.	40	75	+35
4 Earners/SSPs	91	113	+22
5. WDs/EDs	34	44	+10
6 NWDs/NEDs	145	193	+48
7. Earners + WDs/SSPs + EDs	125	157	+32

The picture is broadly the same as that of many other parts of India. The increase in the non-earning dependents is a little more than that of the rural population and the increase in self-supporting persons and earning dependents taken together is a little less than of the urban population.

The percentage of non-earning dependents to the general population has increased from 54 per cent. to 55 per cent. The increase is small. Separate figures for the two major states of this zone are shown below :

TABLE 52

	Percentage of non-earning dependents	
	1931	1951
Rajasthan	47.4	49.6
Punjab	61.0	61.4

There is practically no change in the Punjab. But there is a relatively small increase in Rajasthan. It is to be observed that there is a striking difference between these two states in respect of

*Records of a little over 3 lakhs burnt by fire. They are distributed as 1 lakh SSPs and 2 lakhs NEDs.

the percentages of non-earning dependency. If this difference had been noted and commented on for only one census it would have given rise to a surmise that one of the figures was probably, erroneous. But the persistence of the difference with figures of the same order at both censuses discourages any such surmise. This is one indication among many that it would be wise to accept the census economic data as correct until the contrary is clearly established. Apparently inexplicable differences disclosed by the figures should not be lightly dismissed or attributed to accident or error. More often than not, they are likely to be found to reflect genuine differences of economic structure, themselves firmly rooted in genuine differences of social conditions.

63 *Relative weight of dependence on agriculture (Zone and States)*

The relevant figures are given below :

TABLE 53

(NUMBER IN LAKHS)

		1931	1951	Increase + Decrease—
Earnings S S Ps	Agricultural	53	77	+24
	Non-Agricultural	38	36	—2
WDs/EDs	Agricultural	30	30	
	Non-Agricultural	4	14	+10
Earnings + WDs/ SSPs + EDs	Agricultural	83	107	+24
	Non-Agricultural	42	50	+8

Agricultural employment percentage ranged in 1931 between 58 (based on earners only) and 66 (the figure based on earners and working dependents). There was then a wide margin of uncertainty. In 1951, the corresponding figures were 68 on both counts. From this it may be fairly inferred that there has been some increase in dependence on agriculture and that there was certainly no decrease. Whether the increase was small or large is a matter of considerable doubt.

because of the role of unpaid family helpers in cultivation, which is difficult to evaluate.

Separate figures for the two major states of this zone are furnished below :

TABLE 54

	1931	1951
Rajasthan	59 to 68	75 to 74
Punjab	57 to 63	66 to 65

In each of these two states dependence on agriculture has clearly increased.

64 *Cultivators and Cultivating labourers (Zone and States)*

The relevant numbers for the zone are given below

TABLE 55

(NUMBER IN LAKHS)

		1931	1951	Increase + Decrease—
Earnings/SSPs	Cultivators	42	69	+27
	Cultivating labourers	8	6	—2
WDs/EDs	Cultivators	13	22	+9
	Cultivating labourers	17	7	—10
Earnings + WDs/ SSPs + EDs	Cultivators	80	104	+24
	Cultivating labourers			

After reclassifying the 1931 working dependents shown as cultivating labourers and combining unpaid family helpers, the results are shown below :

TABLE 56

(NUMBER IN LAKHS)

	1931	1951	Increase + Decrease—
Total number of workers in cultivation (including unpaid family helpers)			
Cultivators	72	91	+19
Cultivating Labourers	8	13	+5
Total	80	104	+24

These figures show that the ratio of cultivators to cultivating labourers had been 90 : 10 in 1931 and had become 87 : 13 in 1951.

The corresponding figures for the two major states are shown below :

TABLE 57

	Ratio of Cultivators to Cultivating labourers (including un-paid family helpers)	
	1931	1951
Rajasthan	89 : 11	90 : 10
Punjab	89 : 11	82 : 18

A small decline in the proportion of cultivating labourers has occurred in Rajasthan, the change in Punjab is in the opposite direction.

65. Cultivated acreages and explanation of change in the ratios

Figures are available only for the Punjab. They show an increase of the cultivated acreages from 114 lakhs of acres in 1931 to 120 lakhs of acres in 1951, cultivation *per capita* declining from 106 cents in 1931 to 95 cents in 1951. The total number of workers per 100 cultivated acres has increased from 23 to 26.

It thus appears that the decline in the area of cultivated land *per capita*, is quite large in the Punjab. It is the result of an increase in the number of workers on the land. Conversion of labourers into cultivators of the type mentioned in North and West India is probably the main reason for the small change in Rajasthan.

IX — COMPARISON BETWEEN 1931 AND 1951—

(SUMMARY OF MAIN CONCLUSIONS)

1 — Between 1931 and 1951, population grew faster than cultivation. The area of cultivated land *per capita* is known to have declined significantly in Uttar Pradesh, Bihar, Orissa, Assam, Madras, Mysore,

Travancore-Cochin, Bombay, Madhya Pradesh and Punjab. There is little doubt that if correct figures of cultivation had been available for other states a similar decline would have been observed in all of them.

II — Notwithstanding such decline in the area of cultivated land *per capita*, the relative weight of dependence on agriculture for gainful employment has not declined in the country as a whole. It is probable that it has increased slightly. Such increase is observable in Uttar Pradesh, Bihar, Orissa, Assam, Madras, Hyderabad, Rajasthan and Punjab. Dependence on agriculture has probably not changed in Madhya Pradesh. It has probably diminished in Bombay, West Bengal and Mysore.

III — The main reaction to this general decline in the area of cultivated land *per capita* unaccompanied by a more than proportionate increase in non-agricultural employment, has been a general increase of non-earning dependency. The increase in absolute number of non-earning dependents has exceeded the entire increase of rural population in India as well as in five out of six zones.

The percentage of non-earning dependents to the general population has increased in every major state except Bombay, West Bengal and Punjab. It has decreased slightly in Bombay and West Bengal and is practically unchanged in the Punjab.

The increases in the percentages are not accompanied by any material change in the sex ratio or age-structure. They must, therefore, be regarded as a rough index of the growth of unemployment in different parts of the country.

IV — There has been a general increase throughout the country in the number of cultivators and cultivating labourers (including unpaid family helpers) working on the same area of cultivated land—say 100 acres. The increases are relatively small in the following states: Assam (45 to 48), Bihar (50 to 52), Uttar Pradesh (49 to 51), Madras (34 to 36) and Orissa (29 to 32).

Larger increases are observed in the following States: Punjab (23 to 26), Bombay (17 to 23), Madhya Pradesh (26 to 33) and Travancore-Cochin (41 to 57).

Among the major states for which figures are available, Mysore alone shows a fall in this number (32 to 26)

The figures of increase in the number of workers provide a rough indication that under-employment is growing on the land, but the picture is somewhat blurred by uncertainty about the role of unpaid family helpers in the cultivation of land

V—Material changes have occurred in the percentage of cultivating labourers to all workers in land (that is to say, cultivating labourers and cultivators including their unpaid family helpers)

The percentage has increased in Travancore-Cochin (34 to 50), Hyderabad (33 to 56), Madhya Pradesh (43 to 58), Punjab (11 to 18) and Mysore (13 to 16).

The percentage has remained practically unchanged in Bihar (27 to 28), Madras (38 to 40) and Rajasthan (11 to 10)

In other states, the percentage has fallen: Uttar Pradesh (18 to 10), Orissa (32 to 26), West Bengal (40 to 32), and Bombay (43 to 28)

The fall in the percentage of cultivating labourers is the natural result of increase in the number of cultivators and members of their families occupying the same area of cultivated land. The cultivators' need for employing labourers diminishes, as also their capacity to pay for their services

It is clear, however, that this is not the sole cause of the fall in the proportion of cultivating labourers. There are reasons to believe that in various parts of the country, there were considerable number of people who were in fact cultivators but not acknowledged as such in order to guard against the accrual of occupancy rights in land. There were probably also other people who partook of the characteristics of both cultivators and cultivating labourers and whose classification was open to genuine doubt. As a result of the operation of tenancy legislation (old and new) as well as the

general change in the social climate, it is likely that a 'conversion' has taken place between 1931 and 1951, of many such people from the status of cultivating labourers to cultivators. Such 'conversion' probably accounts for an important part of the fall in the proportion of cultivating labourers observed in Bombay, Uttar Pradesh, and possibly also elsewhere. While there is little doubt about the fact that the proportion of cultivating labourers has fallen and the fall is explainable by the two reasons mentioned above, there are puzzling variations in the nature of the changes which have taken place in different states

VI.—There is a complex inter-relationship between the nature and magnitude of changes of the following description (all of which occurred between 1931 and 1951): the intensity of the decline of the area of cultivated land *per capita*; the rate of urbanization and the rate of growth of non-agricultural avocations, the actual extent to which un-employment has increased and been reflected in the percentage of non-earning dependency, the actual extent to which under-employment has increased and been reflected in the number of workers on unit area of cultivated land; and finally the nature and extent of changes, if any, in the participation of unpaid family helpers in cultivation operations. Much more detailed study and many local enquiries are necessary before this inter-relationship can be unravelled completely.

VII—Among cultivators the relative proportion of those who may be called owner-cultivators because they possess permanent and heritable occupancy rights in land must have increased to some extent between 1931 and 1951. It is not, however, possible to institute a comparison in this respect because of non-comparable classification at the two censuses

VIII—Agricultural rentiers formed only a small proportion of the people in 1931 and this proportion has become still smaller in 1951.

ANNEXURE I

Agricultural Landholders and Landless Agriculturist—1951

ABSTRACT

<i>Ind. a) Zones, Major States</i>	<i>Number per 1,000 Self-supporting persons of general population who are</i>			<i>agricultural landholders</i>	<i>Landless agriculturists</i>	<i>Number of landless agriculturists per 1,000 agricultural landholders</i>
	<i>Landholders Type A</i>	<i>Landholders Type B</i>	<i>Landholders Type C</i>			
1	2	3	4	5	6	7
INDIA	406	32	69	507	204	402
North India .	543	23	87	653	105	161
East India .	421	41	70	532	236	444
South India .	331	19	55	405	253	625
West India .	309	51	27	447	169	378
Central India .	382	51	86	519	231	445
North-West India .	386	13	49	448	224	500
Uttar Pradesh .	543	23	87	653	105	161
Bihar	486	38	50	574	293	510
Orissa . . .	445	51	146	642	174	271
West Bengal .	250	52	64	366	223	609
Assam . . .	513	16	72	601	141	235
Madras . . .	323	18	44	385	275	714
Mysore . . .	492	13	95	600	114	190
Travancore-Cochin .	217	27	86	330	258	782
Bombay . . .	344	48	68	460	176	383
Madhya Pradesh .	377	75	93	545	225	413
Madhya Bharat .	439	23	60	522	207	397
Hyderabad . .	330	44	95	469	236	507
Rajasthan . .	389	16	66	471	256	544
Punjab . . .	376	11	30	417	255	564*

NOTE.—*Landholders Type A* comprise of persons in Livelihood Class I, without subsidiary means of livelihood and those with subsidiary means in livelihood Class IV *plus* persons in Livelihood Class IV without subsidiary means of livelihood, and with subsidiary means in Livelihood Class I.

Landholders Type B comprise of persons in Livelihood Classes I and IV, with subsidiary means in Livelihood Class II or III *plus* persons in Livelihood Class II and Livelihood Class III with subsidiary means in Livelihood Class I or IV.

Landholders Type C comprise of persons in Livelihood Classes I and IV with subsidiary means in Livelihood Classes V to VIII *plus* persons in Livelihood Classes V to VIII with Subsidiary means in Livelihood Class I or IV.

* Exceptional due to temporary displaced 'persons' phenomena

ANNEXURE
Agricultural Landholders and

India/Zones/Major States	Total			Without Subsidiary Income		
	Persons in 000's	Distribu- tion per 10,000	Percentage of total population	Persons in 000's	Distribu- tion per 10,000	Percentage of total population
1	2	3	4	5	6	7
LIVELIHOOD						
INDIA	45,760	10,000	46.93	38,157	8,339	39.14
North India	11,354	10,000	62.27	9,593	8,449	52.61
East India	12,839	10,000	50.07	10,579	8,240	41.26
South India	6,600	10,000	36.35	5,676	8,600	31.26
West India	3,746	10,000	39.75	3,049	8,139	32.35
Central India	6,479	10,000	47.38	5,038	7,776	36.84
North-West India	4,742	10,000	41.53	4,222	8,904	36.98
Uttar Pradesh	11,354	10,000	62.27	9,593	8,449	52.61
Bihar	7,119	10,000	55.29	6,157	8,649	47.82
Orissa	2,335	10,000	59.46	1,703	7,293	43.26
West Bengal	1,872	10,000	32.38	1,408	7,521	24.35
Assam	1,264	10,000	57.89	1,106	8,750	50.65
Madras	4,839	10,000	34.95	4,220	8,721	30.48
Mysore	1,197	10,000	55.46	1,016	8,488	47.07
Travancore-Cochin	547	10,000	26.34	424	7,751	20.42
Bombay	3,396	10,000	40.75	2,729	8,036	32.75
Madhya Pradesh	2,776	10,000	49.51	2,033	7,323	36.26
Madhya Bharat	1,221	10,000	50.43	1,034	8,469	42.71
Hyderabad	1,719	10,000	41.21	1,319	7,617	31.39
Rajasthan	2,512	10,000	43.30	2,172	8,646	37.44
Punjab	1,269	10,000	38.56	1,173	9,243	35.65
LIVELIHOOD						
INDIA	8,766	10,000	8.97	7,006	7,992	7.17
North India	991	10,000	5.15	729	7,356	3.79
East India	2,279	10,000	9.38	1,740	7,635	7.16
South India	1,506	10,000	8.70	1,262	8,380	7.29
West India	926	10,000	9.56	692	7,473	7.14
Central India	918	10,000	6.56	690	7,616	4.93
North-West India	2,146	10,000	17.32	1,893	8,821	15.27
Uttar Pradesh	991	10,000	5.15	729	7,356	3.79
Bihar	986	10,000	8.25	821	8,327	6.87
Orissa	231	10,000	5.93	133	5,757	3.41
West Bengal	748	10,000	12.05	527	7,045	8.48
Assam	277	10,000	12.81	228	8,231	10.54
Madras	1,234	10,000	9.58	1,049	8,501	8.14
Mysore	111	10,000	4.76	95	8,559	4.07
Travancore-Cochin	155	10,000	7.10	114	7,355	5.22
Bombay	837	10,000	9.66	611	7,300	7.05
Madhya Pradesh	457	10,000	4.47	374	8,184	3.66
Madhya Bharat	236	10,000	10.22	285	7,839	8.01
Hyderabad	323	10,000	7.39	249	7,709	5.69
Rajasthan	1,463	10,000	22.86	1,263	8,633	19.74
Punjab	519	10,000	16.12	480	9,249	14.91

Landless Agriculturists—1951

With Subsidiary Income (IV)			With Subsidiary Income (II & III)			With Subsidiary Income (V to VIII)		
Persons in 000's	Distribution per 10,000	Percentage of total population	Persons in 000's	Distribution per 10,000	Percentage of total population	Persons in 000's	Distribution per 10,000	Percentage of total population
8	9	10	11	12	13	14	15	16
CLASS I								
311	68	0 32	2,291	501	2 35	5,001	1,092	5 12
136	120	0 75	345	304	2 89	1,280	1,127	7 02
61	47	0 23	761	593	2 97	1,438	1,120	5 61
20	30	0 11	248	376	1 37	656	994	3 61
26	69	3 20	301	804	3 93	370	988	0 27
47	73	0 35	523	897	3 82	871	1,344	6 37
21	44	0 18	113	238	0 99	386	814	3 35
136	120	0 75	345	304	1 89	1,280	1,127	7 02
37	52	0 29	389	546	3 02	536	753	4 16
8	34	0 20	162	693	4 13	462	1,980	11 77
12	64	0 21	178	951	3 08	274	1,464	4 11
2	16	0 09	25	198	1 15	131	1,026	6 00
14	29	0 10	199	411	1 44	406	839	2 93
2	17	0 09	23	192	1 07	156	1,303	7 23
4	73	0 19	28	512	1 35	91	1,664	4 35
22	65	0 26	293	863	3 52	352	1,026	4 22
26	94	0 47	321	1,156	5 72	396	1,427	7 05
13	106	0 54	49	401	2 02	125	1,024	5 16
6	35	0 14	138	803	3 31	256	1,545	0 37
14	56	0 24	67	267	1 16	259	1,031	4 16
4	32	0 12	23	181	0 70	69	541	2 04
CLASS II*								
451	514	0 46	317	362	0 32	992	1 132	2 02
66	666	0 34	27	273	0 14	169	1,705	0 85
252	667	0 62	140	614	0 58	247	1,664	1 02
70	465	0 40	31	206	0 18	143	949	0 83
52	561	0 54	66	713	0 68	116	1,253	1 20
68	741	0 49	26	283	0 18	134	1,460	0 96
43	200	0 35	27	126	0 2	183	853	1 15
66	666	0 34	27	273	0 14	169	1,705	0 85
60	608	0 50	34	345	0 29	71	722	0 50
28	1,212	0 72	11	476	0 28	59	2,555	1 52
61	816	0 98	87	1,163	1 41	73	976	1 15
2	72	0 09	7	253	0 33	40	1,444	1 55
59	478	0 46	17	138	0 13	109	883	0 55
3	270	0 13	2	180	0 09	11	921	0 47
7	451	0 32	13	839	0 60	21	1,355	0 6
50	597	0 58	65	777	0 75	111	1,321	1 25
30	656	0 29	13	285	0 13	40	675	0 35
12	509	0 52	1	42	0 01	50	1,617	1 55
20	619	0 66	10	310	0 23	14	1,262	1 21
36	246	0 56	19	137	0 31	155	0 1	2 25
4	77	0 12	7	135	0 22	28	53	0 5

*Under Class II Cols 8-10 relate to subsidiary income (III) and Cols 11-15 relate to income (IV) to (VIII).

ANNEXURE

Agricultural Landholders and

India/Zones/Major States	Total			Without Subsidiary Income		
	Persons in 000's	Distribu- tion per 10,000	Percentage of total population	Persons in 000's	Distribu- tion per 10,000	Percentage of total population
1	2	3	4	5	6	7
LIVELIHOOD						
INDIA	14,882	10,000	12 57	13,502	9,072	11 40
North India	1,323	10,000	5 71	1,169	8,836	5 05
East India	4,566	10,000	15 34	4,088	8,953	13 73
South India	3,991	10,000	17 07	3,734	9,356	15 97
West India	1,066	10,000	8 42	959	8,996	7 57
Central India	3,316	10,000	17 57	2,980	8,987	15 79
North-West India	620	10,000	5 34	572	9,226	4 93
Uttar Pradesh	1,323	10,000	5 71	1,169	8,836	5 05
Bihar	2,863	10,000	21 86	2,628	9,179	20 07
Orissa	591	10,000	12 31	496	8,391	10 33
West Bengal	1,037	10,000	12 30	898	8,659	10 64
Assam	60	10,000	1 74	52	8,667	1 51
Madras	3,136	10,000	18 23	2,972	9,477	17 28
Mysore	220	10,000	6 79	206	9,364	6 36
Travancore-Cochin	625	10,000	20 17	550	8,800	17 75
Bombay	1,010	10,000	9 04	907	8,980	8 13
Madhya Pradesh	1,695	10,000	20 41	1,482	8,743	17 84
Madhya Bharat	349	10,000	10 67	322	9,226	9 85
Hyderabad	980	10,000	17 15	898	9,163	15 71
Rajasthan	204	10,000	3 16	180	8,824	2 79
Punjab	282	10,000	7 69	266	9,432	7 25
LIVELIHOOD						
INDIA	1,641	10,000	1 49	1,197	7,294	1 09
North India	254	10,000	1 06	206	8,110	0 86
East India	217	10,000	0 81	156	7,189	0 58
South India	472	10,000	2 15	363	7,691	1 66
West India	217	10,000	1 95	148	6,820	1 33
Central India	287	10,000	1 71	171	5,958	1 02
North-West India	194	10,000	1 79	152	7,835	1 40
Uttar Pradesh	254	10,000	1 06	206	8,110	0 86
Bihar	80	10,000	0 61	62	7,750	0 47
Orissa	67	10,000	1 51	41	6,119	0 92
West Bengal	38	10,000	0 60	28	7,369	0 44
Assam	22	10,000	0 90	14	6,364	0 57
Madras	358	10,000	2 17	281	7,849	1 70
Mysore	77	10,000	2 89	55	7,143	2 06
Travancore-Cochin	34	10,000	1 24	28	8,285	1 02
Bombay	198	10,000	2 00	134	6,768	1 35
Madhya Pradesh	122	10,000	1 62	70	5,738	0 93
Madhya Bharat	24	10,000	0 90	18	7,500	0 68
Hyderabad	129	10,000	2 41	76	5,891	1 42
Rajasthan	75	10,000	1 59	52	6,667	1 06
Punjab	77	10,000	2 15	65	8,442	1 82

Landless Agriculturists—1951—*contd.*

With Subsidiary Income (II)			With Subsidiary Income (I & IV)			With Subsidiary Income (V to VIII)		
Persons in 000's	Distribu- tion per 10,000	Percentage of total population	Persons in 000's	Distribu- tion per 10,000	Percentage of total population	Persons in 000's	Distribu- tion per 10,000	Percentage of total population
8	9	10	11	12	13	14	15	16
CLASS III								
179	121	0 15	469	315	0 40	732	492	0 62
32	242	0 14	60	453	0 25	62	469	0 27
78	171	0 26	152	333	0 52	248	543	0 83
30	75	0 13	59	148	0 25	168	421	0 72
11	103	0 09	45	422	0 36	51	479	0 40
22	66	0 12	144	434	0 76	170	513	0 90
6	97	0 05	9	145	0 08	33	532	0 28
32	242	0 14	60	453	0 25	62	469	0 27
42	147	0 32	65	227	0 50	128	447	0 97
10	169	0 21	29	492	0 61	56	948	1 16
25	241	0 30	57	550	0 68	57	550	0 68
3	500	0 09	5	833	0 14	...	...	...
21	67	0 12	29	92	0 17	114	364	0 66
1	45	0 03	2	91	0 06	11	500	0 34
8	128	0 26	26	416	0 84	41	656	1 32
11	109	0 10	43	426	0 39	49	485	0 42
14	83	0 17	108	637	1 30	91	537	1 10
2	57	0 06	4	115	0 12	21	602	0 64
5	51	0 09	30	306	0 54	47	480	0 81
4	196	0 06	5	245	0 07	15	735	0 24
2	71	0 05	2	71	0 06	12	426	0 33
CLASS IV*								
45	274	0 04	92	561	0 08	307	1,871	0 28
11	433	0 04	4	158	0 02	33	1,299	0 14
10	461	0 04	6	276	0 02	45	2,074	0 17
7	148	0 03	11	233	0 04	91	1,928	0 42
7	323	0 06	14	645	0 13	48	2,212	0 43
3	105	0 02	51	1,777	0 30	62	2,160	0 37
7	361	0 06	5	258	0 05	30	1,546	0 28
11	433	0 04	4	158	0 02	33	1,299	0 14
5	625	0 04	3	375	0 03	10	1,290	0 07
2	299	0 05	3	443	0 07	21	3,134	0 47
2	526	0 03	1	263	0 02	7	1,842	0 11
		...	...	...	...	8	3,636	0 33
4	112	0 02	9	251	0 06	64	1,788	0 39
		...	2	260	0 08	20	2,597	0 75
1	294	0 04	...			5	1,471	0 18
6	303	0 06	14	707	0 14	44	2,222	0 45
1	82	0 01	28	2,295	0 37	23	1,885	0 31
			2	833	0 07	4	1,667	0 15
1	78	0 02	19	1,475	0 35	33	2,556	0 62
6	769	0 12	3	385	0 06	17	2,179	0 35
2	130	0 03	3	390	0 08	8	1,038	0 22

*Under Class IV Cols 8—10 relate to subsidiary income (I) and Cols 11—13 relate to subsidiary income (II & III)

ANNEXURE
Agricultural Landholders and

<i>India/Zones/Major States</i>	<i>Total</i>			<i>Without Subsidiary Income</i>		
	<i>Persons in 000's</i>	<i>Distribu- tion per 10,000</i>	<i>Percentage of total population</i>	<i>Persons in 000's</i>	<i>Distribu- tion per 10,000</i>	<i>Percentage of total population</i>
1	2	3	4	5	6	7
LIVELIHOOD						
INDIA	33,340	10,000	30 15	29,520	8,855	26 70
North India	5,338	10,000	25 81	4,713	8,829	22 79
East India	7,816	10,000	24 40	6,942	8,870	21 64
South India	7,484	10,000	35 73	6,791	9,074	32 42
West India	4,973	10,000	40 32	4,482	8,972	36 18
Central India	4,191	10,000	26 78	3,591	8,354	22 37
North-West India	3,528	10,000	34 02	3,111	8,818	30 00
Uttar Pradesh	5,338	10,000	25 81	4,713	8,829	22 79
Bihar	1,657	10,000	13 95	1,435	8,660	12 08
Orissa	958	10,000	20 71	723	7,547	15 63
West Bengal	4,121	10,000	42 80	3,830	9,291	39 77
Assam	988	10,000	26 66	866	8,765	23 36
Madras	5,396	10,000	35 07	4,984	9,236	32 89
Mysore	757	10,000	30 10	685	9,049	27 24
Travancore-Cochin	1,287	10,000	45 15	1,089	8,415	37 99
Bombay	4,854	10,000	38 54	3,895	8,946	34 48
Madhya Pradesh	1,588	10,000	23 99	1,284	8,686	19 40
Madhya Bharat	687	10,000	27 78	602	8,769	24 34
Hyderabad	1,660	10,000	31 84	1,391	8,380	26 68
Rajasthan	1,409	10,000	29 12	1,138	8,077	23 52
Punjab	1,262	10,000	35 48	1,175	9,311	33 03

Landless Agriculturists—1951—concl'd.

With Subsidiary Income (I & IV)			With Subsidiary Income (II & III)			With Subsidiary Income (V to VIII)		
Persons in 000's	Distribu- tion per 10,000	Percentage of total population	Persons in 000's	Distribu- tion per 10,000	Percentage of total population	Persons in 000's	Distribu- tion per 10,000	Percentage of total population
8	9	10	11	12	13	14	15	16
CLASSES V—VIII								
1,686	505	1.52	805	241	0.73	1,329	399	1.20
314	588	1.52	98	184	0.47	213	399	1.03
389	497	1.21	198	253	0.62	297	380	0.93
316	422	1.51	135	181	0.65	242	323	1.15
250	503	2.03	78	157	0.63	183	368	1.48
287	685	1.84	185	441	1.18	218	520	1.39
130	366	1.25	111	315	1.07	176	499	1.70
314	588	1.52	98	184	0.47	213	399	1.03
96	579	0.81	55	332	0.46	71	429	0.60
107	1,117	2.31	43	449	0.93	85	887	1.84
143	339	1.54	37	90	0.39	107	260	1.10
31	314	0.84	60	607	1.62	31	314	0.84
164	304	1.07	91	169	0.59	157	291	1.02
37	489	1.47	8	106	0.32	27	356	1.07
114	886	4.00	35	272	1.23	55	427	1.93
238	547	2.11	71	163	0.61	150	344	1.34
126	793	1.90	93	586	1.41	85	535	1.28
16	233	0.65	32	466	1.29	37	538	1.50
130	783	2.49	79	476	1.52	60	361	1.15
84	596	1.74	89	632	1.84	98	695	2.02
26	206	0.73	13	103	0.37	48	380	1.35

ANNEXURE

Classification of Population by Livelihood Classes and

Zone/State Livelihood Classes	Classification of						
	1961 Census						1931
	Number per 10,000 of General Population						Number per
	Total number	Total classified population	Self- supporting persons	Non- earning dependents	Earning dependents	Total number	Total classified population
1	2	3	4	5	6	7	8
INDIA	336,597,341	10,000	2,927	6,009	2,064	2,75,154,343	4,451
LIVELIHOOD CLASS I	167,322,511	4,692	1,283	2,807	632		1,031
Do II	31,617,908	837	246	530	111		833
Do III	44,808,888	1,256	17	691	148		1,017
Do IV	5,321,183	149	46	93	10		89
Do V	37,654,374	1,056	340	628	88		573
Do VI	21,310,461	597	165	406	26		239
Do VII	5,619,624	158	49	102	7		43
Do VIII	42,942,391	1,205	381	752	72		626
NORTH INDIA	63,215,741	10,000	3,047	5,754	1,199	49,614,833	4,870
LIVELIHOOD CLASS I	39,361,035	6,227	1,796	3,551	880		362
Do II	3,255,815	515	157	271	87		2,421
Do III	3,612,209	571	210	280	81		690
Do IV	667,612	106	40	62	4		91
Do V	5,101,313	838	371	511	56		525
Do VI	3,179,595	593	144	338	21		231
Do VII	860,011	136	42	89	5		34
Do VIII	6,978,152	1,104	387	652	65		515
Uttar Pradesh	63,215,741	10,000	3,047	5,754	1,199	49,614,833	4,870
LIVELIHOOD CLASS I	39,361,035	6,227	1,796	3,551	880		362
Do II	3,255,815	515	157	271	87		2,421
Do III	3,612,209	571	210	280	81		690
Do IV	667,612	106	40	62	4		91
Do V	5,101,313	838	371	511	56		525
Do VI	3,179,595	593	144	338	21		231
Do VII	860,011	136	42	89	5		34
Do VIII	6,978,152	1,104	387	652	65		515

Active and Semi-active Workers at the 1931 and 1951 Censuses

Population			Active and Semi-active Workers					
Census			1951 Census			1951 Census		
10,000 of General Population								
Earners	Working dependents	Total Un-classified population (Non-working dependents)	Self-supporting persons	Secondary of Self-supporting persons	Secondary of earning dependents	Principal earners	Subsidiary of principal earners	Working dependents
9	10	11	12	13	14	15	16	17
3,761	690	5,549	104,388,469	15,008,924	37,918,321	103,522,483	12,884,028	18,970,100
909	122		45,760,373	7,863,592	12,647,232	25,009,972	1,524,570	3,348,442
633	150		8,765,328	1,466,769	2,498,282	18,802,494	1,651,988	4,121,611
798	219		14,881,181	2,380,291	12,515,363	21,967,741	1,865,233	6,026,886
81	8		1,641,097	864,959	274,442	2,220,191	678,548	231,929
486	87		12,130,498	3,241,671	4,368,306	13,594,657	2,241,834	2,594,675
218	21		5,902,338	1,530,173	1,324,407	6,004,214	1,234,517	564,840
41	2		1,733,866	345,789	224,602	1,130,173	245,286	43,381
545	81		13,573,788	3,314,680	4,065,687	14,993,041	1,642,152	2,238,336
4,176	694	5,130	19,259,510	2,850,616	7,579,806	20,718,172	2,951,496	3,441,300
262	100		11,354,100	362,753	5,148,436	1,301,289	147,182	494,147
1,974	447		990,910	194,731	440,365	9,791,415	790,278	2,220,206
633	57		1,322,468	349,925	692,030	5,138,667	492,568	280,518
83	8		254,053	185,186	24,629	412,991	245,119	41,496
484	41		1,714,932	660,404	477,990	2,402,030	507,728	202,968
217	14		912,618	248,166	148,895	1,077,085	250,771	70,023
34	2		263,805	78,624	20,667	170,506	35,772	1,869
489	26		2,446,624	770,427	626,884	2,424,089	432,078	130,073
4,176	694	5,130	19,259,510	2,850,616	7,579,806	20,718,172	2,951,496	3,441,300
262	100		11,354,100	362,753	5,148,436	1,301,289	147,182	494,147
1,974	447		990,910	194,731	440,365	9,791,415	790,278	2,220,206
633	57		1,322,468	349,925	692,030	5,138,667	492,568	280,518
83	8		254,053	185,186	24,629	412,991	245,119	41,496
484	41		1,714,932	660,404	477,990	2,402,030	507,728	202,968
217	14		912,618	248,166	148,895	1,077,085	250,771	70,023
34	2		263,805	78,624	20,667	170,506	35,772	1,869
489	26		2,446,624	770,427	626,884	2,424,089	432,078	130,073

ANNEXURE

Classification of Population by Livelihood Classes and

Classification of							
1951 Census						1931	
Number per 10,000 of General Population						Number per	
Zone/State Livelihood Classes	Total number	Total classified population	Self- supporting persons	Non- earning dependents	Earning dependents	Total number	Total classified population
1	2	3	4	5	6	7	8
EAST INDIA	94,136,266	10,000	3,076	6,326	598	69,736,495	4,100
I LIVELIHOOD CLASS I	45,129,927	5,007	1,424	3,235	348		1,541
Do II	8,459,103	939	253	616	70		345
Do III	13,830,875	1,535	507	951	77		871
Do IV	721,202	80	24	51	5		56
Do V	7,745,036	859	349	472	38		544
Do VI	4,537,932	504	158	329	17		202
Do VII	1,251,940	138	52	82	4		42
Do VIII	8,451,101	938	309	590	39		499
Bihar	40,225,847	10,000	3,159	6,493	408	32,556,839	4,154
I LIVELIHOOD CLASS I	22,242,436	5,530	1,770	3,529	231		2,908
Do II	3,326,677	827	245	544	38		
Do III	8,795,202	1,187	712	1,899	76		870
Do IV	246,889	61	20	37	4		29
Do V	1,984,665	394	131	247	16		271
Do VI	1,368,007	339	93	232	14		198
Do VII	291,116	73	22	47	4		21
Do VIII	2,370,902	589	166	398	25		457
Orissa	14,645,946	10,000	2,856	6,279	365	12,491,036	4,504
I LIVELIHOOD CLASS I	13,718,822	3,953	1,595	3,759	559		253
Do II	181,9751	594	158	367	69		407
Do III	1,803,966	1,231	403	679	149		1,166
Do IV	219,227	150	46	96	8		40
Do V	1,226,785	633	206	360	67		617
Do VI	425,851	291	95	125	21		200
Do VII	77,538	53	25	35	2		22
Do VIII	1,603,400	1,095	338	668	89		809

II

Active and Semi-active Workers at the 1931 and 1951 Census—*contd*

Population			Active and Semi-active Workers					
Census			1931 Census			1951 Census		
10,000 of General Population								
Earners	Working dependents	Total unclassified population (Non-working dependents)	Self-supporting persons	Secondary of Self-supporting persons	Secondary of earning dependents	Principal earners	Subsidiary of principal earners	Working dependents
9	10	11	12	13	14	15	16	17
3,728	372	5,900	27,724,838	4,224,641	5,389,707	24,001,775	2,870,802	2,597,726
1,488	53		12,839,024	628,995	1,352,207	10,376,863	391,382	370,433
337	8		2,278,925	482,639	469,424	2,346,315	179,290	55,516
751	120		4,566,376	714,007	1,255,104	5,237,172	488,452	838,517
55	1		216,217	123,384	60,323	386,571	124,490	8,431
466	78		3,145,570	742,870	979,225	3,252,685	646,564	447,281
195	7		1,419,797	532,526	376,127	1,361,342	362,335	46,708
41	1		478,021	94,807	67,081	289,477	61,749	3,213
395	104		2,762,908	905,413	830,216	2,755,290	616,640	757,612
4,050	104	5,146	12,706,699	1,601,413	1,637,496	13,184,952	1,193,215	339,568
2,262	46		7,118,833	186,871	323,045	7,369,246	211,374	150,508
			985,856	170,872	160,701			
847	23		2,863,136	378,100	464,439	2,758,931	229,180	73,930
28	1		82,774	51,605	49,988	47,496	39,478	2,487
257	14		526,231	254,888	210,502	837,280	252,991	46,358
196	2		375,996	195,581	144,192	638,559	166,621	7,125
21			87,434	49,350	40,450	68,020	21,230	381
439	18		667,439	314,176	253,179	1,427,420	272,421	58,784
3,773	731	5,496	4,182,456	1,084,783	1,473,464	4,710,330	806,671	914,327
235	18		2,335,636	121,528	222,767	292,683	17,254	22,677
1,370	37		231,374	84,260	47,550	1,721,202	98,582	16,829
917	249		591,074	161,201	416,016	1,144,821	137,657	312,571
38	2		66,323	35,366	8,763	47,206	14,921	5,925
521	95		301,429	225,928	250,126	651,603	109,845	118,272
182	18		138,539	119,689	98,521	227,030	102,161	22,177
12			22,340	16,815	7,693	14,128	16,409	—
407	312		455,541	370,796	362,070	620,272	220,67	100,000

ANNEXURE

Classification of Population by Livelihood Classes and

		Classification of						
		1951 Census					1931	
		Number per 10,000 of General Population					Number per	
Zone (State)	Livelihood Classes	Total number	Total classified population	Self-sustaining persons	Non-sustaining dependents	Earning dependents	Total number	Total classified population
1	2	3	4	5	6	7	8	9
West Bengal		24,820,308	10,000	3,749	6,533	318	17,663,427	3,404
LIVELIHOOD CLASS	I	8,032,757	1,324	754	2,360	120		850
Do	II	2,980,401	1,201	301	840	60		205
Do	III	3,041,881	1,226	418	751	57		764
Do	IV	149,121	60	16	43	1		136
Do	V	3,811,300	1,536	671	832	33		643
Do	VI	2,311,309	932	312	606	14		236
Do	VII	756,297	305	231	170	4		91
Do	VIII	3,736,241	1,506	546	931	29		479
Chandernagore		49,301	10,000	2,461	6,500	39		"
LIVELIHOOD CLASS	I	60	12	4	8	"		"
Do	II	32	6		6	"		"
Do	III	15	3	1	2	"		"
Do	IV	253	51	9	42	"		"
Do	V	15,880	3,182	1,236	1,933	13		"
Do	VI	13,101	2,625	927	1,689	9		"
Do	VII	3,108	603	227	393	3		"
Do	VIII	17,460	3,498	1,057	2,427	14		"
Assam		9,043,707	10,000	2,819	5,687	1,424	6,077,909	5,082
LIVELIHOOD CLASS	I	5,235,791	5,789	1,398	3,401	990		1,977
Do	II	1,156,254	1,281	306	751	221		365
Do	III	157,343	174	67	83	24		676
Do	IV	81,604	90	25	55	20		12
Do	V	1,327,531	1,468	616	685	97		1,581
Do	VI	373,066	399	117	243	30		139
Do	VII	115,569	128	41	89	4		66
Do	VIII	614,529	650	249	386	43		206

Active and Semi-active Workers at the 1931 and 1951 Census—*contd*

Population			Active and Semi-active Workers					
Census			1951 Census			1931 Census		
10,000 of General Population								
Earners	Working dependents	Total Un-classified population (Non-working dependents)	Self-supporting persons	Secondary of Self-supporting persons	Secondary of earning dependents	Principal earners	Subsidiary of principal earners	Working dependents
9	10	11	12	13	14	15	16	17
3,192	213	6,396	7,816,730	1,125,629	787,399	5,639,770	504,496	373,303
850			1,871,483	282,121	65,664	1,504,195	66,723	
205			747,845	144,751	83,525	361,381	19,647	
727	37		1,036,365	155,626	261,243	1,284,424	110,069	65,321
134	2		38,917	23,241	5,028	237,286	62,191	3,357
624	39		1,665,675	157,346	170,701	1,102,563	78,555	32,611
232	4		774,816	153,246	74,326	409,322	60,198	7,088
90	1		326,054	21,312	17,351	158,826	10,934	1,107
330	149		1,355,595	184,986	115,552	582,678	96,179	263,821
			17,274	105	198			
			22	50	3			
			2	3	1			
			5		1			
			46	10				
			6,167	34	42			
			4,626	85	56			
			1,130	7				
			5,276	217	93			
3,609	1,413	4,978	2,612,286	343,359	1,287,969	2,293,456	337,942	858,443
1,755	222		1,264,023	34,200	657,124	1,066,767	86,650	135,187
355	10		276,986	76,634	161,070	215,828	58,883	5,901
68	608		60,310	11,633	65,997	41,183	10,801	369,760
11	1		22,379	8,606	3,450	6,621	7,206	402
1,647	334		620,097	77,740	263,737	696,410	105,540	324,390
125	14		106,293	55,010	44,409	75,793	30,081	8,321
64	1		37,488	5,748	5,805	39,096	12,901	1,274
184	22		224,710	73,786	86,377	111,749	25,879	13,206

ANNEXURE

Classification of Population by Livelihood Classes and

Classification of							
1951 Census						1951	
Number per 10,000 of General population						Number per	
Zone/State Livelihood Classes	Total number	Total classified population	Self- supporting persons	Non- earning dependents	Earning dependents	Total number	Total classified population
1	2	3	4	5	6	7	8
Manipur	377,635	10,000	2,718	4,796	2,486	445,606	4,601
Livelihood Class I	411,362	7,121	1,939	3,519	1,663		2,952
Do II	57,736	1,000	272	409	319		218
Do III	1,381	24	6	10	8		295
Do IV	11,516	200	52	93	55		59
Do V	40,231	698	190	304	204		760
Do VI	24,124	418	111	195	112		169
Do VII	1,070	53	14	27	12		18
Do VIII	18,093	486	134	239	113		129
Tripura	639,025	10,000	1,347	3,709	1,130	382,450	2,809
Livelihood Class I	382,147	5,980	1,772	2,333	875		1,702
Do II	55,930	875	290	464	121		69
Do III	30,886	483	235	206	42		321
Do IV	11,918	187	56	120	11		39
Do V	38,395	601	227	328	46		350
Do VI	40,838	639	195	423	211		67
Do VII	1,314	52	14	36	2		43
Do VIII	75,601	1,189	358	793	30		169
Assam	137,725	10,000	2,412	4,237	3,031	109,508	6,688
Livelihood Class I	115,502	8,386	1,727	3,468	2,191		1,618
Do II	10,409	756	191	424	141		1,447
Do III	199	14	6	6	2		28
Do IV	54	4	1	3			3
Do V	1,123	82	36	40	6		293
Do VI	1,615	139	47	71	1		59
Do VII	1,028	143	133	6	1		6
Do VIII	6,875	499	271	219	9		184

Active and Semi-active Workers at the 1931 and 1951 Census—*contd*

Population			Active and Semi-active Workers						
Census			1951 Census				1931 Census		
10,000 of General population									
Earners	Working dependents	Total Un-classified population (non-working dependents)	Self-supporting persons	Secondary of Self-supporting persons	Secondary of earning dependents	Principal earners	Subsidiary of principal earners	Working dependents	
9	10	11	12	13	14	15	16	17	
1,512	2,689	5,399	157,030	30,786	143,612	111,015	24,307	93,068	
1,706	1,246		112,037	1,385	48,473	76,024	1,462	55,539	
155	63		15,703	697	8,701	6,030	117	2,786	
8	288		366	179	402	344	114	12,807	
53	6		2,093	1,763	591	2,348	455	255	
319	441		10,961	20,527	70,457	14,220	9,184	19,650	
139	30		6,420	3,267	10,215	6,207	2,089	1,350	
17	1		821	229	833	738	263	59	
115	14		7,749	2,733	3,940	5,104	618	622	
2,332	448	7,200	301,121	57,939	73,419	89,948	9,950	17,134	
1,531	171		113,223	2,791	31,678	58,554	7,487	6,512	
69	—		18,528	5,401	4,494	2,646	423	—	
188	153		15,032	4,358	8,782	7,390	625	5,094	
39	—		3,579	2,593	1,508	1,472	234	8	
217	133		14,517	6,307	13,544	8,201	209	5,088	
85	4		12,462	5,620	4,394	3,784	394	153	
42	1		918	1,342	934	1,601	80	24	
183	6		22,863	9,607	8,130	6,993	538	243	
6,497	171	9,392	33,222	302	46,140	77,344	4,181	1,583	
1,648	—		23,788	29	3,454	18,094	432	—	
4,447	—		2,651	21	3,402	43,828	1,532	—	
23	3		88	8	38,224	279	6	34	
3	—		6			36	2	—	
109	84		493	200	116	2,093	1,190	612	
39			643	28	54	647	63	1	
6			1,836	4	25	65	27	—	
100	84		1,735	92	575	1,079	924	1,164	

ANNEXURE

Classification of Population by Livelihood Classes and

Zone/State Livelihood Classes	Classification of						
	1951 Census						1951
	Number per 1000 of General Population						Number per
	Total number	Total classified population	Self- supporting persons	Ac- cording dependents	Expend- ing dependents	Total number	Total classified population
I	2	3	4	5	6	7	8
SOUTH INDIA							
LIVELIHOOD CLASS I	75,600,804	10,000	2,612	6,856	432	57,672,101	4,174
Do II	27,430,839	3,635	873	2,606	156		1,135
Do III	6,576,853	870	199	624	47		274
Do IV	12,935,515	1,707	523	1,052	117		972
Do V	1,622,579	214	62	145	7		106
Do VI	9,995,266	1,322	376	859	77		574
Do VII	4,955,811	656	153	471	22		219
Do VIII	1,582,285	183	47	127	9		46
Do IX	10,631,656	2,413	404	952	57		848
Madras . . .							
LIVELIHOOD CLASS I	57,016,002	10,000	2,615	6,893	472	44,649,433	4,214
Do II	19,926,000	3,495	849	2,493	153		1,021
Do III	5,464,261	958	216	692	50		286
Do IV	10,593,362	1,823	530	1,155	118		1,065
Do V	1,235,167	217	63	147	7		121
Do VI	7,042,941	1,235	331	836	61		556
Do VII	3,871,470	669	167	482	20		310
Do VIII	1,958,845	163	43	119	6		46
Do IX	8,180,956	2,455	399	979	57		839
Mysore . . .							
LIVELIHOOD CLASS I	9,074,972	10,000	2,602	7,061	338	6,857,302	4,354
Do II	5,032,787	5,546	1,319	4,036	171		2,161
Do III	432,415	477	122	332	23		297
Do IV	615,853	678	242	414	22		689
Do V	262,305	290	85	196	9		73
Do VI	926,621	1,025	282	700	43		518
Do VII	505,154	556	135	403	18		196
Do VIII	104,896	115	28	83	4		29
Do IX	1,191,942	1,313	358	877	48		591

II

Active and Semi-active Workers at the 1931 and 1951 Census—*contd.*

Population			Active and Semi-active Workers						
Census			1951 Census				1931 Census		
10,000 of General Population									
Earners	Working dependents	Total Un-classified population (Non-working dependents)	Self-supporting persons	Secondary of Self-supporting persons	Secondary of earning dependents	Principal earners	Subsidiary of principal earners	Working dependents	
9	10	11	12	13	14	15	16	17	
3,744	450	5,826	20,852,531	2,223,974	3,720,362	21,479,929	3,389,736	2,597,245	
1,052	83		6,600,404	303,282	403,901	6,066,625	356,671	479,466	
252	22		1,505,806	166,057	130,225	1,454,032	128,129	125,291	
808	164		3,990,897	327,550	1,379,309	4,660,454	281,026	946,453	
102	5		471,427	120,129	39,319	582,570	69,069	31,728	
483	91		2,841,879	473,639	856,122	2,785,088	374,764	526,254	
208	11		1,230,727	256,139	209,372	1,206,516	221,225	62,854	
44	2		318,869	44,948	47,573	255,859	87,520	8,657	
776	72		3,052,532	523,290	654,541	4,473,765	1,865,332	416,342	
3,830	344	5,826	14,962,541	1,415,070	2,696,192	17,100,394	2,234,358	1,538,480	
988	33		4,839,046	145,359	204,788	4,413,959	113,405	146,663	
273	13		1,233,979	108,980	93,027	1,219,706	93,014	39,695	
902	164		3,135,681	269,761	1,159,387	4,021,881	229,140	734,922	
113	6		358,086	83,314	26,058	312,228	55,835	26,469	
461	75		1,926,442	303,188	446,528	2,055,998	250,124	335,387	
300	10		948,791	176,743	152,285	895,789	159,812	43,667	
45	1		244,107	30,457	28,091	198,360	67,835	6,144	
847	42		1,276,409	140,269	506,028	3,778,535	1,565,175	186,098	
3,844	370	5,446	13,600,876	301,327	306,862	2,350,010	243,111	636,220	
1,768	393		1,196,773	15,428	54,536	1,158,939	15,439	257,736	
219	78		110,391	16,435	20,123	143,674	7,530	51,417	
413	276		220,171	20,502	44,393	270,821	19,067	170,897	
66	7		76,809	27,730	4,691	43,461	6,119	2,242	
363	155		155,658	89,471	78,451	238,162	73,413	101,656	
185	11		122,393	39,464	25,107	121,604	32,077	7,153	
28	1		25,132	2,858	3,561	18,187	12,002	466	
542	49		353,643	93,379	75,000	355,162	75,134	17,111	

ANNEXURE

Classification of Population by Livelihood Classes and

Classification of							
Zone/State/ Livelihood Classes	1951 Census					1931	
	Number per 10,000 of General Population					Number per	
	Total number	Total classified population	Self- supporting persons	Non- earning dependents	Earning dependents	Total number	Total classified population
1	2	3	4	5	6	7	8
Travancore-Cochin	9,280,495	10,000	2,854	6,385	761	6,300,989	3,714
LIVELIHOOD CLASS I	2,444,514	2,634	590	1,893	261		862
Do II	659,106	710	167	493	50		164
Do III	1,871,767	2,016	673	1,141	202		604
Do IV	114,919	124	37	82	5		40
Do V	2,966,244	2,118	681	1,233	204		894
Do VI	631,243	681	169	473	39		908
Do VII	316,438	341	96	216	29		64
Do VIII	1,276,194	1,376	441	864	71		778
Goork	229,405	10,000	3,537	6,090	463	165,327	6,837
LIVELIHOOD CLASS I	77,538	3,380	743	2,523	104		1,354
Do II	23,071	1,006	270	685	51		76
Do III	24,333	1,069	452	520	97		1,102
Do IV	7,188	313	89	216	6		145
Do V	54,459	2,374	1,213	1,012	149		1,019
Do VI	7,944	346	117	220	9		173
Do VII	2,108	91	38	52	2		77
Do VIII	32,354	1,420	615	760	45		2,692
WEST INDIA	40,861,123	10,000	2,628	5,730	1,582	28,599,788	4,049
LIVELIHOOD CLASS I	16,162,774	3,975	921	2,207	853		599
Do II	3,821,521	455	227	506	222		472
Do III	1,425,026	1,422	262	407	179		1,444
Do IV	791,053	196	54	126	16		64
Do V	5,251,574	1,477	439	2,144	144		580
Do VI	3,244,730	795	219	541	35		242
Do VII	573,314	237	63	148	11		51
Do VIII	6,425,371	1,577	493	963	129		597

Active and Semi-active Workers at the 1931 and 1951 Census—*contd*

Population			Active and Semi-active workers					
Census			1951 Census			1931 Census		
10,000 of General Population								
Earners	Working dependents	Total Un-classified population (Non-working dependents)	Self-supporting persons	Secondary of Self-supporting persons	Secondary of earning dependents	Principal earners	Subsidiary of principal earners	Working dependents
9	10	11	12	13	14	15	16	17
3,087	627	6,286	2,648,254	448,828	705,682	1,944,952	592,772	395,475
743	219		547,537	242,006	64,305	463,372	227,603	75,032
142	22		155,049	40,333	16,800	89,491	27,545	14,090
556	48		624,661	37,092	174,512	349,981	32,001	30,425
39	1		34,480	16,300	8,425	24,524	6,478	393
153	141		631,961	76,720	327,340	474,724	49,900	83,833
288	20		156,850	39,338	31,739	181,335	27,721	12,558
61	3		88,749	11,529	15,869	38,076	5,920	2,002
305	273		408,973	85,510	67,898	318,449	215,544	172,137
5,178	1,659	3,163	81,160	11,559	10,616	84,573	13,555	27,100
1,532	2		17,054	489	472	25,355	224	30
71	5		6,187	309	275	1,161	20	76
1,088	23		20,374	295	1,017	17,772	818	219
144	1		2,052	1,725	145	2,357	417	23
996	23		27,818	4,289	3,803	16,264	1,257	372
171	2		2,693	615	241	2,785	725	83
76	1		875	114	58	1,236	833	25
1,030	1,612		14,107	3,332	4,615	17,641	9,251	26,321
3,274	775	5,951	10,927,720	1,618,315	6,433,100	9,363,165	593,752	2,216,910
509	90		3,745,668	225,668	2,443,927	1,456,325	49,170	257,520
422	50		925,586	220,384	657,860	1,206,374	74,722	241,520
1,016	428		1,065,019	237,090	1,925,241	2,901,622	150,150	1,224,485
61	3		217,257	168,225	45,487	275,633	31,410	9,755
430	100		1,782,760	261,545	551,895	1,371,519	105,245	277,121
221	21		857,550	133,534	191,549	631,529	32,443	40,427
49	2		277,392	42,770	25,379	139,660	13,767	1,111
516	81	0	1,025,425	329,093	535,761	1,477,151	119,554	277,121

ANNEXURE

Classification of Population by Livelihood Classes and

Classification of							1931
1931 Census							1931
Number per 10,000 of General Population							Number per
Zone/State Livelihood Classes	Total number	Total classified population	Self- supporting persons	Non- earning dependents	Earning dependents	Total number	Total classified population
1	2	3	4	5	6	7	8
Bombay	35,986,150	10,000	2,793	5,789	1,858	25,738,800	4,081
LIVELIHOOD CLASS I	24,648,885	4,074	944	2,277	853		659
Do II	3,485,000	969	233	517	219		426
Do III	3,252,546	905	281	433	191		1,574
Do IV	711,842	193	55	127	16		64
Do V	4,949,157	1,376	438	811	127		565
Do VI	2,736,313	761	217	508	36		233
Do VII	802,188	223	69	144	10		49
Do VIII	5,370,199	1,494	486	902	106		572
Gujarat	4,237,359	10,000	2,354	5,827	1,829	2,946,881	3,772
LIVELIHOOD CLASS I	1,355,604	3,277	739	1,645	893		151
Do II	345,156	834	182	412	240		857
Do III	155,585	376	118	161	97		855
Do IV	72,775	176	43	120	13		69
Do V	741,679	1,797	428	1,092	277		651
Do VI	444,364	1,074	223	790	61		296
Do VII	107,095	259	64	182	13		66
Do VIII	915,101	2,107	557	1,425	225		827
Kutch	567,606	10,000	1,843	5,730	1,427	514,307	4,051
LIVELIHOOD CLASS I	158,255	2,783	778	1,412	598		232
Do II	54,315	957	242	502	213		464
Do III	16,895	253	126	127	45		1,405
Do IV	9,056	160	46	106	8		70
Do V	105,773	1,916	522	1,131	263		874
Do VI	64,153	1,130	239	844	47		366
Do VII	14,061	245	76	160	12		69
Do VIII	142,071	2,503	814	1,448	241		571

Active and Semi-active Workers at the 1931 and 1951 Census—*contd.*

Population			Active and Semi-active Workers					
Census			1951 Census			1931 Census		
10,000 of General Population								
Earners	Working dependents	Total Un-classified population (Non-working dependents)	Self-supporting persons	Secondary of Self-supporting persons	Secondary of earners dependents	Principal earners	Subsidiary of principal earners	Working dependents
9	10	11	12	13	14	15	16	17
3,369	712	5,919	9,792,261	1,517,918	5,599,342	8,468,951	571,566	1,791,845
564	95	3,395,691	215,104	2,192,470	1,417,737	47,939	239,936	
385	41	836,624	212,706	599,567	967,504	72,411	103,888	
1,118	396	1,009,842	227,187	1,677,602	2,809,714	146,657	995,164	
61	3	197,054	157,928	40,426	153,292	30,775	8,002	
474	91	1,575,997	245,517	451,516	1,191,930	103,848	229,446	
216	17	761,544	121,235	158,849	543,422	46,089	42,289	
47	2	246,832	39,312	23,651	118,857	13,393	4,534	
504	67	1,746,677	298,929	455,261	1,265,995	108,454	168,586	
2,558	1,214	6,228	974,055	75,611	752,752	753,878	15,976	857,878
91	60	305,835	7,886	296,968	26,751	842	17,782	
790	127	75,228	4,386	53,024	215,189	1,828	37,437	
235	620	49,066	8,631	223,084	69,341	2,272	182,701	
64	5	17,568	7,775	4,744	18,819	407	1,591	
495	156	177,119	12,149	90,705	145,673	2,885	45,806	
245	51	92,472	10,194	32,457	72,213	3,162	15,124	
60	6	26,226	1,427	4,283	17,564	329	1,699	
638	189	230,541	23,163	107,487	188,028	4,251	51,768	
2,746	1,305	5,949	161,404	24,786	81,096	141,236	6,210	67,117
230	2	44,142	2,698	14,489	11,837	369	112	
460	4	13,734	3,292	5,269	23,681	473	205	
497	908	7,141	1,272	24,555	25,567	1,221	45,720	
69	1	2,635	2,525	317	3,522	226	41	
660	214	29,644	3,882	9,675	33,627	1,512	10,900	
309	57	13,164	2,105	3,243	15,894	1,192	2,036	
63	6	4,334	2,031	445	3,248	45	253	
458	113	46,210	7,001	23,013	23,560	1,149	5,507	

ANNEXURE

Classification of Population by Livelihood Classes and

Classification of							
1951 Census						1951	
Number per 10,000 of General Population						Number per	
Zone/State Livelihood Classes	Total number	Total classified population	Self supporting persons	Non- earning dependents	Farming dependents	Total number	Total classified population
1	2	3	4	5	6	7	8
CENTRAL INDIA	54,267,559	10,000	2,907	5,295	1,998	42,422,453	5,059
LIVELIHOOD CLASS I	24,767,467	4,738	1,240	2,428	1,070		1,256
Do II	3,427,226	656	176	333	147		543
Do III	9,181,910	3,716	634	691	431		1,480
Do IV	894,200	371	55	90	26		135
Do V	5,822,900	1,115	329	602	184		647
Do VI	1,485,483	476	331	310	35		372
Do VII	668,532	128	37	82	9		49
Do VIII	5,020,941	960	305	559	96		636
Madhya Pradesh	21,247,533	10,000	3,031	4,430	2,539	17,990,937	5,280
LIVELIHOOD CLASS I	10,519,128	4,971	1,307	2,100	1,444		1,817
Do II	949,762	447	121	182	144		82
Do III	4,336,281	1,640	798	666	376		2,075
Do IV	343,708	161	58	75	29		32
Do V	2,252,033	1,060	333	524	203		548
Do VI	512,601	439	125	274	40		203
Do VII	311,818	147	43	93	11		33
Do VIII	1,602,202	754	246	416	92		390
Madhya Bharat	7,195,134	10,000	3,167	5,171	962	6,297,861	4,391
LIVELIHOOD CLASS I	4,012,371	5,043	1,535	2,042	566		1,169
Do II	812,476	1,021	298	622	301		926
Do III	848,618	1,867	438	497	132		1,118
Do IV	71,941	92	31	51	9		102
Do V	792,491	996	319	605	72		644
Do VI	446,571	561	152	389	20		274
Do VII	84,779	107	31	72	4		50
Do VIII	835,916	1,274	369	693	58		708

ANNEXURE

Classification of Population by Livelihood Classes and

		Classification of					1951 Census	
		Number per 10,000 of General Population					1951	
Zone / State	Livelihood Classes	Total number	Total classified population	Self-supporting persons	Non-earning dependents	Earning dependents	Total number	Total classified Population
1	2	3	4	5	6	7	8	9
Hyderabad		18,655,108	10,000	2,579	5,433	1,958	14,436,148	4,773
Livelihood CLASS	I	7,687,627	4,122	922	2,274	926		731
Do	II	1,377,934	738	173	581	184		347
Do	III	3,799,773	1,715	525	761	429		914
Do	IV	449,490	241	69	139	33		306
Do	V	2,525,501	1,354	339	757	238		760
Do	VI	954,516	511	133	339	37		331
Do	VII	243,192	130	36	84	10		49
Do	VIII	2,117,075	1,189	360	628	131		1,046
Bhopal		836,474	10,000	3,567	5,856	577	729,955	4,528
Livelihood CLASS	I	311,138	3,719	1,228	2,219	272		1,082
Do	II	59,659	713	266	406	41		829
Do	III	167,425	2,002	841	1,047	114		980
Do	IV	10,108	121	46	67	8		95
Do	V	87,944	1,051	384	597	70		385
Do	VI	51,739	619	186	412	21		257
Do	VII	13,287	159	61	96	2		48
Do	VIII	135,154	1,616	355	1,012	49		652
Vindhya Pradesh		3,574,690	10,000	3,150	5,383	1,467	2,967,552	6,093
Livelihood CLASS	I	2,258,003	6,261	1,847	3,498	916		18
Do	II	227,395	656	222	314	100		3,403
Do	III	629,813	1,762	620	821	321		1,521
Do	IV	18,953	53	20	27	6		15
Do	V	164,231	460	151	250	59		675
Do	VI	100,036	280	88	170	22		179
Do	VII	15,465	43	15	26	2		16
Do	VIII	180,594	505	187	277	41		266

II

Active and Semi-active Workers at the 1931 and 1951 Census—*contd.*

Population			Active and Semi-active Workers					
Census			1951 Census			1951 Census		
10,000 of General Population								
Earners	Working dependents	Total Un-classified Population (Non-earning dependents),	Self-supporting persons	Secondary of Self-supporting persons	Secondary of earning dependents	Principal earners	Subsidiary of principal earners	Working dependents
9	10	11	12	13	14	15	16	17
3,344	2,371	5,287	4,811,189	873,483	3,709,294	4,823,882	965,735	1,878,632
541	190		2,719,132	309,507	455,518	781,649	144,359	274,183
261	86		322,863	93,742	91,593	377,377	73,088	124,517
653	261		979,777	167,252	2,376,304	942,348	160,232	377,082
221	85		129,508	67,477	15,721	313,697	72,756	121,996
543	226		670,051	183,062	340,016	783,842	179,028	326,758
386	165		252,127	60,283	89,371	557,205	129,424	237,805
37	12		67,015	11,615	12,442	52,861	6,204	16,805
700	346		670,716	185,545	327,409	1,009,902	200,644	499,486
4,348	182	5,472	298,237	32,356	48,496	817,853	19,502	13,331
1,050	32		102,715	1,348	8,144	76,646	2,005	2,353
789	40		12,226	3,192	3,554	57,624	2,501	2,896
922	58		70,349	6,679	19,338	67,321	2,823	4,236
98	2		3,811	225	169	6,805	1,027	163
562	23		32,088	9,750	8,551	41,046	9,393	1,683
352	6		15,516	3,634	2,498	18,401	1,868	397
48	.		5,120	600	563	3,465	372	30
680	22		46,412	7,528	5,624	45,945	5,513	1,573
4,640	1,453	3,897	1,126,115	152,722	511,524	1,376,846	188,492	431,276
18	..		660,255	15,958	232,796	5,211	675	69
2,062	1,341		79,317	4,857	21,998	612,015	90,628	397,785
1,482	39		221,767	18,098	159,983	439,779	16,032	11,669
15	..		7,296	2,572	1,888	4,420	1,310	25
612	63		53,896	51,166	47,614	181,486	48,999	12,595
172	7		31,276	16,437	14,043	50,993	15,443	1,975
16	..		5,478	2,753	1,311	4,826	2,665	25
263	3		66,830	40,881	32,311	78,216	12,740	567

ANNEXURE

Classification of Population by Livelihood Classes and

		1951 Census					1931
		Number per 10,000 of General Population					Number per
Zerri State Livelihood Classes	Total number	Total classified population	Self- supporting persons	Non- earning dependents	Earning dependents	Total number	Total classified population
1	2	3	4	5	6	7	8
NORTH-WEST INDIA							
Livelihood Class I	34,721,815	10,000	3,234	5,509	1,257	27,119,671	4,606
Do II	14,420,469	4,153	1,366	2,066	721		823
Do III	6,012,310	1,731	618	898	215		1,209
Do IV	2,853,333	534	178	293	63		916
Do V	621,907	179	56	107	16		85
Do VI	2,959,985	861	267	509	85		615
Do VII	2,906,810	816	221	576	41		240
Do VIII	533,512	154	47	101	6		50
Do IX	5,383,169	1,550	481	959	170		668
Rajasthan							
Livelihood Class I	15,390,797	10,000	3,706	4,956	1,338	11,225,722	5,278
Do II	6,621,852	4,330	1,642	1,907	781		239
Do III	3,495,773	2,286	957	1,052	277		1,549
Do IV	474,996	311	134	134	43		1,739
Do V	244,278	160	51	95	14		56
Do VI	1,357,916	888	298	488	102		658
Do VII	1,005,565	658	182	448	28		265
Do VIII	143,112	92	28	62	4		36
Do IX	1,945,066	1,273	414	770	89		736
Punjab							
Livelihood Class I	12,399,133	10,000	2,671	6,062	1,267	10,842,456	3,872
Do II	4,502,193	3,575	1,024	2,214	637		991
Do III	1,993,890	1,609	418	932	209		1,044
Do IV	957,753	775	223	453	94		285
Do V	254,503	214	63	129	22		112
Do VI	911,564	736	198	462	76		597
Do VII	1,173,916	615	215	633	64		220
Do VIII	127,000	104	31	67	6		51
Do IX	1,195,770	1,002	491	1,122	159		572

Active and Semi-active Workers at the 1931 and 1951 Census—*contd*

Population			Active and Semi-active Workers					
Census			1951 Census			1931 Census		
In 600 of General Population								
Earners	Working dependents	Total Un-classified population (Non working dependents)	Self supporting persons	Secondary of Self-supporting persons	Secondary of earning dependents	Principal earners	Subsidiary of principal earners	Working dependents
9	10	11	12	13	14	15	16	17
3,355	1,251	5,394	11,229,113	1,276,876	4,364,241	9,098,240	1,005,889	3,392,044
699	124		4,741,716	121,511	1,690,857	1,894,815	91,874	335,227
856	353		2,145,995	141,046	537,837	2,321,871	256,761	916,192
308	608		619,331	137,046	701,786	833,818	93,956	1,649,999
81	4		194,648	73,176	64,717	218,541	94,093	10,155
519	96		927,587	347,596	591,146	1,408,634	190,407	260,813
226	14		766,867	107,980	156,348	614,173	82,131	37,652
49	2		162,706	34,048	27,911	131,821	17,916	4,055
617	51		1,670,263	324,475	593,639	1,674,565	178,751	137,881
3,746	1,532	4,712	5,665,469	854,785	2,046,936	4,204,710	441,565	5,720,553
239	"		2,511,042	83,544	796,422	2,688,440	14,617	"
1,549	"		1,463,293	104,023	284,018	1,738,454	157,490	"
373	2,566		205,997	93,919	336,200	418,772	42,846	1,534,039
56	"		77,977	142,714	34,960	62,727	9,346	"
548	110		455,461	262,822	324,987	614,880	98,818	124,043
253	22		277,969	63,671	45,244	283,640	39,690	13,579
15	2		43,109	13,693	9,333	39,089	6,461	760
693	43		632,616	191,374	224,872	778,708	72,897	48,112
2,953	919	6,128	3,310,828	249,961	1,568,563	3,203,269	356,191	995,403
934	57		1,269,731	22,335	570,955	1,612,533	26,723	61,254
376	668		518,786	23,826	202,208	408,022	68,993	724,755
158	27		282,004	19,810	263,267	280,209	36,261	29,251
103	9		77,998	18,286	33,513	112,392	61,073	9,179
512	85		245,223	43,763	159,905	355,068	57,026	92,510
203	17		269,870	26,305	87,426	220,101	25,709	18,281
49	2		38,569	5,455	10,522	53,149	8,380	2,704
518	54		608,648	90,066	300,737	561,795	69,421	55,469

ANNEXURE

Classification of Population by Livelihood Classes and

Classification of							
1951 Census						1931	
Number per 10,000 of General Population						Number per	
Zone/State Livelihood Classes	Total number	Total classified population	Self- supporting persons	Non- earning dependents	Earning dependents	Total number	Total classified population
1	2	3	4	5	6	7	8
Patiala and East Punjab States Union	3,493,685	10,000	2,990	6,102	908	2,911,826	4,110
LIVELIHOOD CLASS I	1,680,126	4,833	1,440	2,807	588		1,781
Do II	404,877	1,159	348	696	115		535
Do III	358,676	1,027	312	613	82		521
Do IV	82,005	235	78	147	10		117
Do V	255,406	731	215	471	45		521
Do VI	267,119	764	213	530	21		162
Do VII	139,019	398	119	265	14		40
Do VIII	297,457	851	265	553	33		633
Delhi	1,744,073	10,000	3,220	6,336	444	526,246	4,222
LIVELIHOOD CLASS I	120,808	692	164	415	113		287
Do II	16,497	95	27	59	9		449
Do III	19,776	168	45	107	16		180
Do IV	5,605	32	12	18	2		27
Do V	302,097	1,732	545	1,111	76		890
Do VI	596,131	4,271	663	1,561	47		667
Do VII	95,168	546	276	335	15		246
Do VIII	778,470	4,464	1,388	3,710	166		1,476
Almer	693,373	10,000	3,659	5,082	1,259	560,392	5,239
LIVELIHOOD CLASS I	259,645	3,745	1,539	1,391	815		633
Do II	21,786	514	237	119	58		545
Do III	19,568	282	157	90	35		1,246
Do IV	13,906	201	77	100	24		54
Do V	131,038	1,833	656	1,106	171		648
Do VI	85,250	1,244	231	867	46		542
Do VII	23,027	313	91	232	10		271
Do VIII	133,050	1,948	672	1,177	100		960

ANNEXURE

Classification of Population by Livelihood

		Classification of					
		1951 Census				1981	
		Number per 10,000 of General Population				Number per	
Zone/State Livelihood Classes		Total number	Total classified population	Self- supporting persons	Non- earning dependents	Earning dependents	Total classified population
1		2	3	4	5	6	7
Himachal Pradesh and Hilarpur		1,109,466	10,000	3,539	4,048	2,413	943,140
LIVELIHOOD CLASS	I	926,805	8,354	2,007	3,294	2,153	3,344
Do	II	79,487	716	255	295	166	2,095
Do	III	11,084	100	50	35	15	139
Do	IV	11,260	102	36	54	12	61
Do	V	28,944	260	101	126	33	408
Do	VI	18,659	161	51	97	12	79
Do	VII	4,336	40	22	15	3	22
Do	VIII	29,491	266	115	132	19	353

II Classes and Active and Semi-active Workers at the 1931 and 1951 Census—*concl*

Population			Active and Semi-Active Workers					
Census			1931 Census			1951 Census		
10,000 of General Population								
Earners	Working dependents	Total Un-classified population (Non-working dependents)	Self-supporting persons	Secondary of Self-supporting persons	Secondary of earning dependents	Principal earners	Subsidiary of principal earners	Working dependents
9	10	11	12	13	14	15	16	17
2,943	3,489	3,568	392,472	42,773	267,767	277,696	55,880	328,932
1,653	1,691		322,518	5,462	205,001	155,902	14,569	159,440
501	1,535		28,234	2,835	15,797	47,214	9,528	144,819
130	9		5,520	3,806	10,483	12,362	696	760
60	1		3,980	1,454	997	5,612	6,229	129
370	138		11,205	15,854	26,312	25,423	11,278	13,016
73	6		5,941	3,164	2,796	7,002	2,629	477
12	...		2,301	1,048	1,054	1,302	407	16
244	209		12,753	7,130	5,327	23,059	10,604	10,273

PART D

Note on Data Relating to Cotton Textiles

1 The cotton textiles industry is one of the most important industries in the country and there is considerable public interest in handloom weavers. In 1947, the Government of India appointed a Committee to investigate certain facts relating to handloom and mill industries. The State Governments furnished data, to the Committee, on handloom weavers

The 1951 Census has also furnished figures regarding the number of self-supporting persons whose principal means of livelihood, is the manufacture of cotton textiles. A comparison between these two sets of data brings to light certain discrepancies which, at first sight, seem very large. In reality they compare rather well in the limited field within which comparison is possible, but there is a field where comparison is not possible. It is necessary that this fact should be explained in order that users of census statistics may not be misled. Hence this note

2 The figures furnished in the 1951 Census are limited to 'self-supporting persons', that is to say, they consist only of those persons (a) who are engaged in the manufacture of cotton textiles, (b) who are not dependent on others for their maintenance either wholly or in part, and (c) for whom the manufacture of cotton textiles is either the sole source of income or the most important source of income. None is included who does not satisfy all three tests. The following persons are excluded: (a) Those 'self-supporting persons' who obtain their principal income from some other source, and (b) 'earning dependents' who earn a part of their maintenance by participation in the manufacture of cotton textiles (these would include the unpaid family helpers of handloom weavers). The number of these two types of people who perform auxiliary but, nonetheless, useful role in handloom weaving was indeed ascertainable, but it has not been ascertained since the extent of tabulation of data relating to Secondary means of livelihood had to be restricted, with reference to considerations of time and money.

3 While 1951 Census figures are thus limited to the 'self-supporting persons'—definite information of a type hitherto not available has been provided. The numbers in every state (and district) are analysed separately for urban and rural areas and also separated into (i) employees, (ii) self-employed workers other than employers, and (iii) employers. There were 20.6 lakhs of self-supporting persons in cotton textiles according to the 1951 Census of whom 18.3 lakhs were males and 2.3 lakhs were females. 8.7 lakhs lived in villages and 11.9 lakhs lived in towns, 9.8 lakhs were employees, 10.2 lakhs were self-employed workers other than employers, and 0.6 lakhs were employers.

4 Full-time weavers (India)

The Fact Finding Committee have furnished data separately for full-time weavers, part-time weavers, paid assistants, and unpaid assistants. We shall refer to all weavers other than full-time weavers as 'auxiliary weavers'. It is reasonable to assume that 'full-time weavers' of the Fact Finding Committee's Report are comparable with the 'self-supporting persons' of the 1951 Census. The latter include—under cotton textile industries—not only handloom weavers but also workers in cotton textile factories. There are, however, officially published data based on factory returns which specify the numbers of the latter separately. If we deduct the number of factory workers as thus specified from the number of self-supporting persons of 1951 Census, we can get a dimensional picture of full-time handloom weavers. According to the 1951 Census, as already stated, there were 20.6 lakhs of self-supporting persons in cotton textiles. The number of factory and mill workers according to official statistics (relating to January, 1953) is 7.8 lakhs. This figure falls short (as it should) of the number of 'employees' ascertained at the 1951 Census. If we deduct these 7.8 lakhs, we are left with a balance of 12.8 lakhs which may be assumed to be the figure of full-time handloom weavers according to the 1951 Census. The total number of full-time weavers in India according to the Fact

Finding Committee's report in 1951 was 13 lakhs.* Though the figures are thus very close, there is one complication. The latter figure of 13 lakhs relates to *all handloom workers* and not only to cotton looms and according to the Fact Finding Committee, cotton handlooms were 72 per cent of all looms. The proportion, however, differed between States and it is impossible to say what deduction—in terms of men—should be made. All that we can say is that we have got one figure for 1941 which shows that full time weavers (inclusive of textiles other

than cotton textiles) numbered 13 lakhs. We have another figure for 1951 which shows that full-time weavers (limited to cotton textiles) numbered 12.8 lakhs. The latter figure is not inconsistent with the earlier one.

5. Full-time Weavers (Zones and States) :

The table below gives for zones and major states the number of full-time weavers given in the Fact Finding Committee's Report and the number according to the 1951 Census :

TABLE

(Figures in Thousands)

Zone/State	Full-time weavers according to Fact Finding Committee's Report	Self-supporting persons according to 1951 Census	Factory returns	Full-time weavers according to 1951 Census
1	2	3	4	5
Total Zones	1,200	2,062	783	1,279
Estimate for the area for which figures were not available	100	..	..	.
INDIA	1,300	2,062	783	1,279
North India	182	267	51	216
Uttar Pradesh	182	267	51	216
East India	276	359	40	119
Bihar	83	30	1	29
Orissa	30	38	5	33
West Bengal	61	77	34	43
Assam	3	7		7
South India	425	572	122	450
Madras	370	501	100	401
Mysore	34	37	18	19
Travancore-Cochin	21	34	5	29
West India	121	603	443	160
Bombay	121	564	432	132
Central India	152	309	91	218
Madhya Pradesh	54	110	32	78
Madhya Bharat	5	69	44	25
Hyderabad	93	124	12	122
North-West India	144	151	37	114
Punjab	144	42	5	37
Rajasthan		77	7	70

* Total number of full time weavers according to Table XI at page 55 of the Fact Finding Committee's Report. Deduct for territories in West Punjab on the basis of the proportion of 1931 Census Principal Earners under Cotton Textiles in the districts now in Pakistan to the total in all districts. Deduct for territories in East Bengal on similar basis.

Estimated number of full-time weavers for rest of India (Estimate of the Committee for full time and part time weavers was 1.75 lakhs).

TOTAL 11.99 or 12.00 lakhs

GRAND-TOTAL 13.00

The table shows that except for a few individual States the two figures are comparable on the Zonal and State level. It should be observed again that one figure relates to 1941 and is inclusive of all textiles; and the other relates to 1951 and is limited to cotton textiles.

6 Auxiliary weavers—(i) FACT FINDING COMMITTEE'S REPORT.

According to data furnished by the State Governments to the Fact Finding Committee, there were nearly 41 lakhs of auxiliary workers. This takes into account all handlooms and on the proportional basis, the auxiliary workers cotton textiles would be of the order of 30 lakhs.

(ii) 1951 CENSUS (a).—There is no figure based on the 1951 Census for the reasons already stated—tabulation of data regarding secondary means of livelihood was limited. We have, however, figures for Secondary means of livelihood relating to the entire field of production (other than cultivation). There were 42.8 lakhs of Earning Dependents including unpaid family helpers. There were also 31.4 lakhs of self-supporting persons, with some other principal means of livelihood who also derived a secondary means of livelihood in this manner. There were, thus, 74 lakhs of persons (47 lakhs of males and 27 lakhs of females) in India under 'Production, other than cultivation'. Since we do not know how many of these are engaged in cotton textiles manufacture, we cannot comment on the compatibility of the 1951 Census data with those of the Fact Finding Committee's Report. But we can say that the overall total of the people whose secondary means of livelihood is classified as 'Production other than cultivation' is sufficiently large to allow of 30 lakhs—the figure mentioned by the Fact Finding Committee—being correct.

(b) Should it be deemed essential that this number should be cleared up, it is possible to extract the 1951 Census data specially from the National Register of Citizens. There is a separate part of this register written up for every village and ward of a town or city in the country. The papers are preserved in the custody of district officers or other local officers of the State Governments. There is a record in the register in respect of every citizen enumerated in the 1951 Census whether he/she is a self-supporting person, an

earning dependent or a non-earning dependent and complete details for his/her principal means of livelihood and secondary means of livelihood are also given. From this information, numbers of persons, whose Secondary means of livelihood is Cotton Textiles can be ascertained.

(iii) 1931 CENSUS.—According to the 1931 Census there were nearly 10.3 lakhs of persons who could be classified as auxiliary weavers. They are only about a third of the number reported by the Fact Finding Committee. The Committee was not altogether sure about its own number so it may have been over-pitched. On the other hand there may have been a real increase since 1931. Comparison with 1931 cannot be pursued much further than that.

(iv) Census of Small Scale Industries.—At the instance of the late Mr YEARTS, the State Governments undertook a census of 'Small-Scale Industries'. This census was intended to cover industrial establishments not covered by the factory returns, e.g., establishments—(a) without power employing less than 20 persons, and (b) with power employing less than 10 persons. As the staff employed at the census was not given thorough training as in the population census, it seemed doubtful whether a complete cover was achieved in all States. There was also a special difficulty in that the prescribed definition was exclusive of factory enterprises at one end and one-man enterprises at the other end, and it was difficult to make sure how this definition worked and to what extent one-man enterprises got included or excluded. For these reasons, the results were not tabulated or published on an all-India basis,—but some State Governments are including this data in the District Census Hand Books. On a reference being made to the results of this enquiry, it is ascertained that the number of persons who could be classified as auxiliary weavers was nearly 20 lakhs. As far as it goes, this figure tends to show that the true number of auxiliary weavers is likely to be closer to the Fact Finding Committee's report than that of the 1931 Census.

(v) Distinction between 'dependants' of weavers and 'auxiliary weavers':

Not all 'auxiliary weavers' are dependants belonging to the families of full-time weavers. At the same time not all members of the families of full-time weavers (and therefore supported by income earned through handloom weaving)

are auxiliary weavers. If it should be thought necessary to ascertain the 1951 number of auxiliary weavers (in the manner described as possible in sub-para (ii) (b) above) instructions should be issued for the purpose to distinguish these two concepts clearly. The entries in the National Register of Citizens are so made that it would be possible to ascertain the number of all persons who are dependent members of the households of full-time weavers, distinctly from the numbers of all persons who are auxiliary weavers.

7 We may recapitulate the main points. It should be borne in mind that the 1951 Census data are limited to 'self-supporting persons' who are engaged in the manufacture of cotton

textiles as their principal means of livelihood. When this information is combined with information about factory returns—we obtain the figures set out in the Table in para 5. The figures are consistent with figures of full-time weavers as found by the Fact Finding Committee.

We are not on sure ground, however, when we deal with either auxiliary weavers (whether or not also dependant on full-time weavers) and dependent members of the households of weavers (whether or not also auxiliary weavers). The tabulations of the 1951 Census throw no light on these people. It is, however, possible (if deemed necessary) to make special effort and extract this information from the National Register of Citizens prepared at the 1951 Census.

APPENDIX IV
FAMINE AND PESTILENCE

APPENDIX IV

Famine and Pestilence

Part A—List of Famines and Scarcities

(i) Famines and Scarcities from 1769-70 to 1902-03

[FROM IMPERIAL GAZETTEER OF INDIA, (VOL. III), 1907]

<i>Year</i>	<i>British territory</i>	<i>Native territory*</i>
1769-70 . .	F Bihar, Northern and Central Bengal S Eastern Bengal †	.
1782-3 . .	F Madras city and its environs S Bombay and its environs	F Haidar Ali's country S Cutch and neighbouring country
1783-4 . .	S Bihar and adjoining British Districts in United Provinces	F Present United Provinces, Eastern Punjab, Kashmir, and Rajputana
1791-2 . .	S Northern Madras	F Hyderabad, Southern Maratha country, Deccan, Gujarat, and Marwar
1802-3 . .	.. ..	F Deccan and Hyderabad
1803-4 . .	F Province of Agra	F Central India and Rajputana
1806-7 . .	F Central Madras	.
1812-3 . .	S Part of the Provinces of Agra and Madras, and Gujarat	F Cutch, Kathiawar, and Rajputana S Baroda, and parts of Gujarat
1823-4 . .	F Northern Madras S Gujarat and Northern Deccan	.. ..
1832-3 . .	F Northern Madras	S Hyderabad and Southern Maratha country
1833-4 . .	S Northern Deccan, Gujarat, and trans- Jumna districts of the Province of Agra, including Delhi and Hissar	S Rajputana, Jhansi and Central India
1837-8 . .	F Central and trans-Jumna districts of the Province of Agra, including Delhi and Hissar	.. . .
1838-9 . .	S Gujarat	S Cutch and Kathiawar
1844-5 . .	S Deccan	.. ..
F=FAMINE		S=SCARCITY

*This list is incomplete. For the earlier famines in Native territory no information exists; only those which came prominently to the notice of British officers have been recorded.

†These tracts, though still (in 1907) nominally under Native rule, were at the time under British control.

(i) Famines and Scarcities from 1769-70 to 1902-03—*contd.*

<i>Year</i>	<i>British territory</i>	<i>Native territory</i>
1853-5	F Bellary District of Madras S Adjoining Districts of Madras and the Southern Deccan	S Hyderabad
1860-1	F Upper Doab of the Province of Agra, Delhi and Hissar Divisions of the Punjab	F Eastern Rajputana S Cutch
1865-6	F Orissa (also 1867) and Bihar, Bellary and Ganjam Districts of Madras S The rest of the east coast; the Southern Deccan in Bombay; Western and Central Bengal	S Mysore and Hyderabad
1868-70	F Ajmer; trans-Jumna Districts of the Province of Agra, Delhi and Hissar Divisions of the Punjab S Adjacent parts of the Province of Agra and the Punjab, Gujarat; Northern Deccan, Northern and South-eastern Districts of the Central Provinces	F Rajputana S Cutch
1873-4	F Bihar S Adjacent strip of the United Provinces and Bundelkhand	.. ..
1876-7	F Madras and Bombay	F Mysore and Hyderabad
1877-8	F Madras, Bombay and United Provinces S Punjab	F Mysore and Hyderabad S Kashmir
1883-4	S Hissar and Rohtak Districts of the Punjab	.. ..
1884-5	S Lower Bengal, Bellary and Anantapur Districts of Madras	.. ..
1888-9	F Ganjam District of Madras S Northern Bihar & Orissa	F Orissa Tributary States
1890-2	S Kumaon and Garhwal, Ajmer	S Parts of Rajputana
1891-2	S Bihar, the Central and Carnatic Districts of Madras, the Southern Deccan in Bombay, Upper Burma	.. ..
1896-7	F Madras (Circars and Deccan); Bombay Deccan, Bengal, United Provinces; Part of the Delhi Division of the Punjab, the Central Provinces, Berar S Rest of the Delhi Division, and Ferozepore and Gujrat Districts of the Punjab, Upper Burma	F Northern and Eastern Rajputana, parts of Central India and Hyderabad

F=FAMINE :

S=SCARCITY

(i) Famines and Scarcities from 1769-70 to 1902-03—*contd.*

Year	British territory	Native territory
1899-1900	F Bombay, Central Provinces, Berar, Ajmer, Hissar District of the Punjab S Parts of Madras, Bengal and Agra, and Delhi Division of the Punjab	F Hyderabad, Rajputana, Central India, Baroda, Kathiawar, Cutch, and the Feudatory States of the Central Provinces, and Eastern Punjab
1900-1	F Gujarat S The Deccan and Carnatic Districts of Bombay	.
1901-2	F Gujarat S The Deccan and Carnatic Districts of Bombay, Ajmer	S Rajputana and parts of Central India
1902-3	S Parts of the Chhatusgarh and Nagpur Division of the Central Provinces	. ..

F=FAMINE . S=SCARCITY

(ii) List of Famines and Scarcities from 1903-04 to 1946-47

[BASED ON DATA COLLECTED BY STATE CENSUS SUPERINTENDENTS]

Year	Districts in Brown and Yellow Belts (Rainfall)*	Other districts
(a) Famines		
1903-04	.. ..	Surat district of Bombay
1904-05	Banaskantha district of Bombay	.. ..
1906-07	.. ..	Darbhangha district of Bihar
1907-08	Buapur district of Bombay	Panch Mahals district of Bombay, all districts of Vindhya Pradesh; and Burdwan district of West Bengal
1908-09	.. ..	Ranchi district of Bihar
1911-12	Ahmedabad, Banaskantha and Sabarkantha districts of Bombay	Panch Mahals and Baroda districts of Bombay
1913-14	Gird, Bhind, <i>Tawarghat</i> , Sheopor and <i>Narwar</i> districts of Madhya Bharat	Surat district of Bombay; and all districts of Vindhya Pradesh
1915-16	Banaskantha district of Bombay	.. ..
1917-18	.. ..	All districts of Vindhya Pradesh
1918-19	Ahmednagar, Ahmedabad and Amreli districts of Bombay; Gird, Bhind, <i>Tawarghat</i> , Sheopor, <i>Narwar</i> , Bhilsa and <i>Isagarh</i> districts of Madhya Bharat	Baroda district of Bombay, Santhl Parganas and Bhawalpur districts of Bihar

*Brown Belt: Areas of average annual rainfall between 25 and 50 inches.
Yellow Belt: Areas of average annual rainfall below 25 inches.

(ii) Famines and Scarcities from 1903-04 to 1946-47—*contd.*

Year	Districts in Brown and Yellow Belts (Rainfall)	Other districts
(a) Famines— <i>concd.</i>		
1919-20 .	Satara district of Bombay	.. ..
1920-21 . .	Ahmednagar, Bujapur and Belgaum districts of Bombay	All districts of Vindhya Pradesh
1921-22 . .	Satara district of Bombay	.. ..
1923-24 .	Banaskantha district of Bombay	.. ..
1924-25	Satara district of Bombay	.. ..
1928-29	.. ..	Bankura district of West Bengal
1931-32 .	Bellary district of Madras	.. ..
1934-35 . .	Bellary and Anantapur districts of Madras	. ..
1935-36 . .	Belgaum, Banaskantha and Kolhapur districts of Bombay	. ..
1937-38 . .	Banaskantha district of Bombay; Bellary, Kurnool and Anantapur districts of Madras	. ..
1938-39 . .	Hissar, Rohtak and Gurgaon districts of Punjab	. ..
1939-40 . .	Coimbatore district of Madras; Hissar, Rohtak and Gurgaon districts of Punjab	.. ..
1940-41 . .	Sholapur, Belgaum, Banaskantha, and Kolhapur districts of Bombay; and Hissar district of Punjab	. ..
1941-42 . .	Hissar district of Punjab	. ..
1942-43 . .	Bujapur district of Bombay; Bellary, Kurnool and Anantapur districts of Madras	All districts of Vindhya Pradesh
1943-44 . .	.. ..	Birbhum, Nadia, Murshidabad and Cooch-Behar districts of West Bengal
1944-45 . .	Belgaum and Kolhapur districts of Bombay	. ..
1945-46 .	Bellary and Anantapur districts of Madras	. ..
(b) Scarcities		
1903-04 . .	Ahmedabad district of Bombay, Bellary and Coimbatore districts of Madras	Baroda district of Bombay, and Chingleput district of Madras
1904-05 . .	Bellary and Coimbatore districts of Madras	Chingleput district of Madras
1905-06 . .	Nasik, Ahmednagar, Poona, Sholapur, Bujapur, Belgaum, Dharwar and Ahmedabad districts of Bombay, Bellary and Coimbatore districts of Madras	Chingleput district of Madras

(ii) Famines and Scarcities from 1903-04 to 1946-47—*contd.*

Year	Districts in Brown and Yellow Belts (Rainfall)			Other districts
(b) Scarcities— <i>contd.</i>				
1906-07 .	Bellary and Coimbatore districts of Madras			Saran, Bhagalpur, Saharsa, Gaya, Champaran, Muzaffarpur, Monghyr, Patna, and Shahabad districts of Bihar, and Chingleput district of Madras
1907-08 . .	Nasik, Poona, Sholapur, West Khandesh districts of Bombay, Bellary and Coimbatore districts of Madras, and all districts of Madhya Bharat			Nagar and Baroda districts of Bombay; Bankura and Nadia districts of West Bengal, and Chingleput district of Madras
1908-09 . .	..	..	..	Darbhanga, Chhota Nagpur (all districts in the Plateau), and Saran district of Bihar; and Nadia district of West Bengal
1909-10 . .	Ahmedabad district of Bombay			Bankura district of West Bengal
1910-11 . .	..	..	..	Bankura and Murshidabad districts of West Bengal
1911-12 . .	Nasik, Ahmednagar, Poona, Sholapur, Bijapur, Belgaum, Dharwar, West Khandesh and Kaira districts of Bombay			Broach district of Bombay; and Bankura district of West Bengal
1912-13 . .	Ahmednagar, Poona, Sholapur, Bijapur, West Khandesh, and Satara districts of Bombay; and <i>Amhera</i> district of Madhya Bharat			.. ..
1913-14 . .	Poona, Sholapur, Bijapur and Satara districts of Bombay, and <i>Amhera</i> district of Madhya Bharat			Bankura district of West Bengal; and all districts of Vindhya Pradesh
1914-15 . .	..	..	..	Hazaribagh, Palamau and Santhal Parganas districts of Bihar
1915-16 . .	Dharwar and Ahmedabad districts of Bombay			Panch Mahals and Kanara districts of Bombay, and Bankura district of West Bengal
1917-18 . .	Bijapur and Dharwar districts of Bombay			Panch Mahals, Dangs and Baroda districts of Bombay
1918-19 . .	Nasik, Poona, Sholapur, Bijapur, Belgaum, West Khandesh, East Khandesh and Kaira districts of Bombay			Panch Mahals, Broach and Satara districts of Bombay, Krishna district of Madras, and all districts of Vindhya Pradesh
1919-20 . .	Poona, West Khandesh and East Khandesh districts of Bombay			Broach and Baroda districts of Bombay; Burdwan and Murshidabad districts of West Bengal
1920-21 . .	Nasik, Poona and Sholapur districts of Bombay; Bellary, Kurnool and Anantapur districts of Madras			Panch Mahals, Broach and Satara districts of Bombay

(ii) Famines and Scarcities from 1903-04 to 1946-47—*concl'd*

Year	Districts in Brown and Yellow Belts (Rainfall)	Other districts
(b) Scarcities— <i>concl'd</i> .		
1921-22 .	Sholapur district of Bombay	Dangs and Broach districts of Bombay
1923-24 . .	Bijapur district of Bombay	.
1924-25 . .	Bellary and Anantapur districts of Madras	.. .
1925-26 . .	Sholapur and Bijapur districts of Bombay, <i>Amhera</i> , Bhind, Sheopur, <i>Narwar</i> , Mandsear, and Shajapur districts of Madhya Bharat	.. ..
1927-28 . .	Kaira, Ahmedabad, Satara and Sabarkantha districts of Bombay	Panch Mahals district of Bombay; Bankura and Nadia districts of West Bengal
1928-29 . .	Gird, Bhind, <i>Tawalgar</i> , Sheopur and <i>Narwar</i> districts of Madhya Bharat	All districts of Vindhya Pradesh
1929-30 . .	Gird, <i>Malwa Prant</i> , Gwalior <i>Prant</i> districts of Madhya Bharat	Baroda district of Bombay
1931-32 . .	.	All districts of Vindhya Pradesh
1932-33 . .	Dharwar and Satara districts of Bombay; and Hissar district of Punjab	Bankura district of West Bengal
1933-34 . .	Satara district of Bombay	.. ..
1935-37 .	Ahmednagar, Poona, Sholapur, Bijapur districts of Bombay, Gird, Sheopur, Bhilse, Goona <i>Prant</i> , <i>Sardapur</i> districts of Madhya Bharat; and Hissar district of Punjab	Panch Mahals, Broach and Kolhapur districts of Bombay; and Bankura districts of West Bengal
1937-38 . .	Ahmednagar, Poona, Sholapur, Bijapur and Ahmedabad districts of Bombay	Panch Mahals, Kolaba district of Bombay, and Bankura district of West Bengal
1939-40 . .	Sholapur and Ahmedabad districts of Bombay	. . .
1940-41 . .	.. ..	Burdwan, Birbhum and Bankura districts of West Bengal
1941-42 . .	Ahmednagar, Sholapur, Bijapur, Belgaum, Dharwar and Satara districts of Bombay; Shajapur, Gwalior <i>Prant</i> , <i>Sardapur</i> and <i>Pargana Sumer</i> districts of Madhya Bharat	Panch Mahals district of Bombay
1943-44 . .	Ahmednagar, Poona, Sholapur, Belgaum, and Dharwar districts of Bombay	Surat district of Bombay and Malda district of West Bengal
1944-45 . .	.. ..	Bankura district of West Bengal
1945-46 . .	Poona, Sholapur, Bijapur, Belgaum, Dharwar, Ahmedabad and Satara districts of Bombay	.. ..
1946-47 . .	.. ..	Murshidabad district of West Bengal

Part B — Old Famines

(2) Extracta from the Report of the Indian Famine Commission—1880

THE NUMBER OF FAMINES AND THE INTERVALS BETWEEN THEM

The first lesson taught by this review is that (except in Burma and the most eastern parts of Bengal, where the rain has never been known to fail, and Sind, in which the population is wholly dependent on river-irrigation) hardly any part of our Indian Empire has escaped the visitation of severe famine during the last century, and that over considerable portions acute distress has recurred frequently. Taking all the 21 famines and scarcities recorded in the last 109 years in any part of India, the proportion is 24 years of bad seasons to 85 years of good, or about two bad to seven good, in each case on an average one-twelfth of the population of the whole country, that is about 20 millions, may be approximately taken as the portion affected, so that the result might be said to be equivalent to a famine or scarcity over the whole country once in 54 years. Of these calamities, 8 may be classed as intense famines, 9 as famines, and 4 as severe scarcities.

Omitting severe scarcities, there have been 17 famines, affecting 20 years, and occurring at an average interval of 5 years.

There have been eight greater famines, affecting 11 years, and occurring at intervals which have varied from 2 or 3 to 40 years, and which average 12 years. Of these, five have occurred in the present century, and have affected 202 millions of people, so that each on an average has been felt by 40 millions, or one-sixth of the population of India.

LIABILITY OF DIFFERENT PROVINCES TO DROUGHT

The liability of the several provinces to severe drought appears to be as follows. In Bengal during the 110 years over which our records extend, four droughts only have occurred, of which two were very severe. Previous to the Orissa Famine, Bengal had enjoyed complete immunity from famine for 81 years, and on this occasion, as well as in 1783-4, only the western parts of the province were affected. In the North-West Provinces nine droughts are recorded, of which two were intense and three very severe. The two greatest famines in this part of the

country, those of 1783 and 1837-8, were separated by an interval of 53 years, but there was a frequent and highly irregular occurrence of less important droughts. In Bombay nine seasons of drought appear, of which two were extreme. In Madras there were eight such seasons, of which two were excessive. Excluding Bengal, the average interval between the several recorded droughts, great and small, in any one province, is about 11 to 12 years, and between those of the severest type about 50 years, but the deviations from these averages are very large, and the records are not sufficiently accurate to give more than approximate results.

These conclusions may be otherwise summed up by stating that the Government of India must be prepared for the occurrence of scarcity, in some degree of severity and in some part of the country, as often as two years out of every nine; and that great famines may be anticipated at average intervals of 12 years. The danger of extreme famines in any one province or locality arises on the average not oftener than once in 50 years, though drought followed by severe distress must be expected as often as once in 11 or 12 years. The records are not of a nature to enable us to form any decided opinion whether droughts have recurred more frequently of late years than formerly; but, bearing in mind the far greater attention paid to these visitations recently, our general conclusion is adverse to such a supposition.

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square miles, with a population of 36 millions. In the next year an area of 52,000 square miles in the North-West Provinces and the Punjab, with a population of 22 millions, was afflicted by a failure of the rains, though it suffered to a far less degree. Distinguishing the three degrees of famine as intense, severe, and slight, the famine in Southern India was intense in an area of 105,000 square miles, inhabited by a population of 19 millions; it was severe in an area of 66,000 square miles, with a population of 11 millions, and it was slight in an area of 34,000 square miles, with a population of 6 millions. Where the distress was but slight the necessity for giving relief arose only in isolated localities and the administration of famine relief on such a scale as to need special measures was in practice confined to the tracts where the famine was intense or severe. Relief was afforded to 780,000 persons or 5 per cent. of the population of the more afflicted area in Madras for 22 consecutive months, and in Bombay to 320,000 persons, or 3½ per cent., for 13 months. The maximum number relieved during the worst month was about 500,000 daily in Bombay and 2½ million in Madras, or from 6 to 15 per cent. of the population severely affected.

In Bengal, in 1873-4, the area severely affected was 21,000 square miles, and the population of that area was 10 millions; of that population about 10 per cent. received direct relief for an average period of 9 months, and the highest number in receipt of direct relief at any one time was about 20 per cent., or 2 millions daily.

The famine of 1868-9 is the one which came nearest to that of 1876-8 in severity; indeed, it surpassed that calamity in extent, for it covered the space of 300,000 square miles. It was intense over an area of 113,000 square miles, but of these 110,000 square miles were in the Native States of Rajputana, and were thinly inhabited, the population of this tract being only 7½ millions. The famine was severe over 112,000 square miles (only half of which was in British territory), and among a population of 21 millions, two-thirds of whom were British subjects. The famine of 1865-6 ranks third in respect of the area it covered, and the population it affected was even larger than that in 1868-9, or in the Southern Peninsula in 1876-8, but the distress it caused was not nearly so grievous. The area of intensity was the Province of Orissa and the

neighbouring districts to north and south, a tract which contained only 31,000 square miles, with a population of 6 millions, and the famine was severe in 50,000 square miles more, with 11½ million inhabitants. In the rest of the country afflicted by it the distress was slight, and little or no relief was called for. Hence, in spite of the wide area of the drought, this famine was less generally disastrous than either of the two great calamities which succeeded it.

Looking then to those parts of the country in which there have been the worst famines and the greatest distress, we find in the history of the past no case which has surpassed the famine of 1876-8 in intensity, and it seems reasonable to conclude that it is not likely to be exceeded in the future, either in the extent of British territory affected or in the degree of relief that will be required. On this presumption it may be estimated that the largest population likely to be severely affected by famine at one time may be put at 30 millions. To arrive at the numbers likely to come on relief, we may safely take a proportion slightly lower than that of the Bihar famine, say 15 per cent., or four and a half millions, as the maximum number likely to be in receipt of relief in the worst months, and about 7 or 8 per cent., or from two to two and a half millions, as the average number likely to require relief continuously for the space of a year. These proportions provide for relief on a scale about double that actually given in Madras and Bombay in 1876-78.

THE CLASSES THAT SUFFER FROM FAMINE

The first effect of drought is to diminish greatly, and at last to stop, all field labour, and to throw out of employment the great mass of people who live on the wages of such labour. A similar effect is produced next upon the artisans, the small shopkeepers, and traders, first in villages and country towns, and later on in the larger towns also, by depriving them of their profits, which are mainly dependent on dealings with the least wealthy classes; and lastly, all classes become less able to give charitable help to public beggars, and to support their dependents. Such of the agricultural classes as possess a proprietary interest in the land, or a valuable right of occupancy in it, do not as a rule require to be protected against starvation in time of famine unless

the calamity is unusually severe and prolonged, as they generally are provided with stocks of food or money, or have credit with money-lenders. But those who, owning only a small plot of land, eke out by its profits their wages as labourers, and rack-rented tenants-at-will living almost from hand to mouth, are only a little way removed from the class of field labourers, they possess no credit, and on them pressure soon begins. Thus the classes who are the earliest in point of time to feel the need of relief are (1) the actually landless class who live on the wages of labour, and the smallest proprietors or occupiers; (2) artisans and small traders, (3) infirm persons and beggars who ordinarily live on the charity of the public or of individuals, and (4) the dependents of all persons who by reason of their own distress can no longer support them. These classes again fall into two chief categories: (1) Those who are accustomed and able to perform work of some sort; and (2) those who from any cause are incapable of labour.

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MORTALITY DURING THE FAMINE OF 1876-8 AND IN THE LAST 30 YEARS

It has been estimated, and in our opinion on substantial grounds, that the mortality that occurred in the provinces under British Administration during the period of famine and drought extending over the years 1877 and 1878 amounted, on a population of 190 millions, to 5½ millions in excess of the deaths that would have occurred had the seasons been ordinarily healthy, and the statistical returns have made certain, what has long been suspected, that starvation and distress greatly check the fecundity of the population. It is probable that from this cause the number of births during the same period has been lessened by two millions, the total reduction of the population would thus amount to about seven millions. Assuming the ordinary annual death-roll, taken at the rate of 35 per mille on 190 millions of people, to be 6½ millions the abnormal mortality of the famine period may be regarded as having increased this total by about 40 per cent.

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RECUPERATIVE POWER OF THE COUNTRY

But great as is the loss of life which has attended these terrible visitations, we are not without hope

that their effects will in future be gradually diminished in intensity, partly by the more efficient character of the relief given, partly by the extension of the means of communication and development of internal trade, and partly by that greater preparedness of the people to meet them which grows from the increase of thrift and resourcefulness, and the accumulation of capital due to a settled and civilised Government. It is, we believe, demonstrable that the effects produced by the famine of 1876-8 on the general prosperity of the country have been less disastrous than those of former calamities, none of which were more grievous and most of which were not to be compared to it in severity. The famine of 1770 resulted in wide-spread desolation of the most afflicted districts, so that we read of "depopulation and ruin," "the thinness of the inhabitants," "many hundreds of villages entirely depopulated," "half the ryots credibly reported to have perished" and a complete disorganisation among the landed classes which lasted for many years. The famine of 1803 struck such a blow at the prosperity of Khandesh and Ahmednagar that even in 1867 the traces of its ravages were still visible in the ruins of deserted villages which had not been repopulated. In the famine of 1833 so much land went out of cultivation in the Gunjur district that even in 1850 the land revenue was only three-fourths of what it had been in 1832. In 1837, in the North-Western Provinces, "the pressure was so great that the ordinary bonds of society seemed to be broken by it. In 1841, the still deserted lands and abandoned houses" in the Btawah district bore evidence to the devastation and waste of life, and during the next five years the land revenue continued to be less by 12 per cent than in the period preceding the famine. Col. Baird Smith testified that similar effects were hardly noticeable in 1860-1. Thus, he attributed to the increased power of resistance and self-support among the landowners following the introduction of long term settlements, which dated from about 1840. Still more remarkable are the facts recorded in the agricultural statistics of Bombay and Madras for the year 1877-8. In Madras the area occupied exceeded by 50,000 acres that of 1874-5, and the land revenue was eight lakhs of rupees in excess of the average demand before the famine. In Bombay there was an actual increase of 70,000 acres of revenue-paying occupied land in excess of the previous year, and the land revenue was increased by one lakh over that of 1876-7, and by 4½ lakhs over

the average of the last 10 years. We may hope that the same recuperative power of the country will manifest itself more and more clearly in future; and that it will, by degrees, extend from the landowning classes to all parts of the population.

(u-a) Extracts from the All-India Census Report, 1891

UP TO 1891. The next of the influences that we have to consider is that of famine, with which we have in India always to reckon. Most fortunately, the 10 years under review have been almost free from this calamity, and the one or two cases of serious failure of crops that did occur were purely local and restricted to very narrow limits, both territorially and with respect to the population affected. In fact, the only occurrence of this description worth mentioning is the scarcity that prevailed in the northern portion of the east coast of Madras, in 1889, and even here the direct effects were comparatively small, but the great famine of 1876-78 in the Deccan and South India, . . . has impressed itself rudely on the census returns. Here, as in the case of Orissa, in 1886, and Rajputana, two years later, and again, of the North-West Provinces, in 1861, the effects will be marked out in the age-tables until the generation that suffered them has passed out of life. But, for the present, we have only to consider famine as one of the checks on the growth of the population, not in its detailed action on the latter. That check is exercised in a two fold manner, directly and indirectly. It not only increases the number of deaths, but it tends to diminish that of births otherwise than by merely destroying possible parents. As regards the first, the number of people who die from actual want of food is probably small compared to the deaths which result from the greater hold which disease gets on those who are enfeebled by diminution of their usual supply of nutriment. Thus, in times of scarcity, the mortality from ordinary causes, such as bowel complaints and intermittent fever, rises considerably above the normal rate. Since many succumb who would in ordinary times offer a successful resistance. The second of the results just mentioned was very prominent in the age returns at the census of 1881 for the Deccan and Southern India, and reappears at the age of 10 to 14 in those of 1891.

From these data it is clear that famine is most felt in the first four or five years of life.

(u-b) Extracts from the All-India Census Report, 1901

1891 TO 1901. In 1891-92 there was scarcity over a considerable area in Madras and Bombay, and in parts of Bihar. In 1895 a weak monsoon led to extensive crop-failure in the southern districts of the United Provinces, and a sudden cessation of the rains of 1896 resulted in famine in the United Provinces, the Central Provinces, and Berar, and parts of Madras, Bombay, Bengal, the Punjab, Upper Burma, Rajputana, Central India and Hyderabad. Altogether an area of about 300,000 square miles with a population of nearly 70 millions was affected and on the average, two million persons were relieved daily during the twelve months from October 1896 to September, 1897, the number rose to more than 4 millions at the time of greatest distress. .

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In 1899 the monsoon again failed, and the results were even more disastrous, for though the population affected was slightly less than in 1896-97, famine conditions prevailed over an area half as great again and with less easy means of communications, the drought was much more severe, the people had not yet recovered from the previous visitation, the mortality amongst cattle from want of fodder and water was far heavier, and the tracts which suffered most lay for the greater part in Native States where the relief organisation was necessarily less perfect than in British territory. In the height of this famine there were for weeks together over six million persons in receipt of relief, and the value of the agricultural production of the year was estimated by the Viceroy to have been 60 millions sterling below the average, there was also a loss of some millions of cattle.

It is impossible to say with any pretence to accuracy what was the actual mortality caused by these calamities. The Commission of 1901 thought that about a million deaths were attributable to the famine of 1899-1900 in British Territory, and it would probably be safe to assume that another three millions must have occurred in the Native States, which contained more than three-fifths of the population afflicted.

and where the relief operations were generally far less successful. No estimate has been made of the excess mortality in 1896-97 but it cannot have been much less than a million. The total mortality due to the two famines may therefore be taken roughly at five millions. The diminished vitality of the people resulted also in a heavy fall in the birth rate, but this was to some extent counterbalanced by an unusually high rate of reproduction when the people had recovered their normal condition.

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Berar

After fifty years of almost unbroken prosperity Berar was visited during the ten years preceding the last census by two famines, which followed each other in close succession and reduced the population by 143,475 persons or 4.9 per cent.

Everywhere, except in the hilly tract of the Satpura range known as the Melghat taluk, the famine of 1895-97 was due rather to an inordinate rise of prices than to actual scarcity of food. It was felt most severely by the large class of field labourers for whom there was no work and by the half-starved immigrants who flocked in from the Central Provinces and helped to swell the death roll. Although the death-rate of Berar rose in this year from 37.6 to 52.6 per thousand, there were few deaths from starvation among the natives of the Province, except in the Melghat. Here the failure of crops was complete, there were no stores of grain to fall back upon, the jungle tribes—Bhils, Korkus and Gonds—were too shy, too inert, and too unused to regular labour to come on to the relief works, and a considerable number of them admittedly died of want. The famine of 1899-1900 was a calamity of a more formidable type, brought about by the great atmospheric movements which determine the variations of the monsoons. Not only did both the autumn and spring crops fail completely, there was also a dearth of fodder, the stores of grain which are still habitually maintained had been exhausted in 1897 and not replenished in the following year, and, to complete the disaster, the sources of water-supply dried up and a large number of cattle perished from thirst. The death-rate rose from 40 to nearly 83 per thousand, the birth-rate fell from 50 to 31. The number of deaths returned was 236,022, being nearly four times as many as oc-

curred in 1898. Some of these people no doubt were immigrants from the neighbouring parts of Hyderabad, but no estimate of their number can be made, and it is impossible to doubt that there was considerable mortality among the inhabitants of the Province.

The age statistics contained in Imperial Table VII show very clearly that excess mortality arising from famine, and from the diseases which accompany famine, must have played a very large part in producing the results which the census tables record. Proceeding on broad lines, so as to neutralise the characteristic defects of the statistics, we find that in 1901, the number of children under 10 in Berar was less by 154,208, or 38.2 per cent, than it was in 1891. It will also be seen that the number of persons between 50 and 60 declined by 11,703 or 14.2 per cent, while in the period "60 and over", the reduction amounted to 47,673 or 27.2 per cent. For the ages under 5 the vital statistics show that 545,127 births were registered in Berar during the five years 1896-1900. Of these children, only 287,986 were surviving in March 1901 and 257,141 or 47 per cent had died. Bearing in mind the untrustworthy character of the data, I refrain from pursuing the comparison for individual years. The broad facts speak for themselves. Excessive mortality among the very young and a high, though less striking, death rate among the old are the inevitable consequences of famine on a large scale. Even if there are no deaths from actual starvation, the weaker members of the population are bound to succumb in large numbers to the fever, which is always present, and to the special diseases, cholera, dysentery and diarrhoea, which the abnormal conditions tend to produce. But if the Berar age tables bring out these necessary limitations of famine relief, they equally illustrate the great improvement in famine administration which we owe in the main to the Commission of 1880. The chief feature which distinguishes a modern famine, not only from the earlier famines vaguely noticed in history but also from such disasters as attacked Orissa in 1866 and Madras in 1877, is the fact that in the earlier famines starvation assailed all classes and all ages of the community. The weakest doubtless suffered most, but the strong did not escape, and the deaths among adults of both sexes were numerous enough to leave their traces on the birth-rate for years to come. A glance at the

Barar figures show how great an advance has been made on the earlier state of things. For the two sexes taken together, the reproductive ages generally show an increase, and the great decline of population is limited to the very young and the very old. The birth returns confirm this view. The people recovered rapidly from the famine of 1897 and the number of births, which fell in 1898 to 89,414 rose in the next year to 144,034, the highest figure ever recorded in Barar.

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Bombay.

In 1876-78 the whole of the Deccan and South Maratha country was severely affected by a famine which is estimated to have caused 800,000 deaths in excess of the usual number. As a consequence, in spite of better enumeration, the growth of population registered in 1881 was barely a third of a million. In the next decade the conditions were far more favourable. There was no famine, and not even a particularly bad harvest, and there were no specially severe epidemics. The population, therefore, grew rapidly and by 1891 it had risen to 26,960,421 to which British territory contributed 18,878,314 and the Native States 8,082,107. The proportional variation was 14.4 per cent in British territory and 16.5 per cent in the Native States, or 1 per cent in the Presidency as a whole.

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For some years after 1891 the seasons were normal and, with the exception of occasional visitations of cholera there was no unusual mortality, but then followed "a succession of famines, bad seasons and plague epidemics unrivalled in the recent history of any other part of India."

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The famine of 1896-97 fell most heavily on the Deccan districts and Bijapur. In the rest of the Presidency the scarcity did not amount to famine, and relief works were not necessary, but there was wide-spread suffering from the high prices which prevailed. During the next two years the crops seem to have been fair, except in the Deccan, but then came the famine of 1899-1900. This calamity, following as it did on a succession of lean years, caused even greater distress in the Deccan than its predecessor of 1896-97, but the brunt of it fell on

the well cultivated and usually fertile plains of Gujarat, "the garden of Western India" which until then had been regarded as outside the famine zone.* Sind, owing to its dependence upon irrigation, again escaped, and so did the Konkan and South Marathi Country. The area affected on this occasion was nearly twice as great as in the famine of 1876-78 and the maximum daily average number of persons relieved was three times as great. When the census was taken over 100,000 persons were still in the relief camps.

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The result of the adverse conditions of the decade is that the census of 1901 shows a decrease of a million and a half, or 5 per cent, as compared with that taken ten years previously; the population of British territory has fallen to 18,559,561, a drop of 2 per cent, while that of the Native States is now only 6,998,648, or 14 per cent. less than in 1891. The returns of the Sanitary Department show an excess of births over deaths to the extent of 645,000 in the first six years of the decade, and of 47,000 in the first six years of the decade, and of 47,000 in the years 1898 and 1899, while in the two famine years, 1897 and 1900, there was an excess of deaths amounting to 120,000 in the former, and 813,000 in the latter year.

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With the exception of Surat where there is a decline of only 2 per cent, all the districts in Gujarat show a serious loss of population, varying from 14 to 18 per cent. The results are equally bad for the Native States of Cutch and Kathiawar and they are even worse in the case of Baroda.

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* That is to say, at the present day. The terrible famine which devastated Gujarat in 1630 was probably one of the most severe of these scourges that ever visited India.

† In the Memorandum on the Material Condition of the people of Bombay Presidency, 1892-1901, it is said that plague and famine by increased mortality and reduced birth-rate caused a loss of two and a half millions in British territory and of two millions in the Bombay State.

This tract suffered comparatively little from plague and it was not seriously touched by famine until 1899-1900.

There can be but little doubt that the famine of this disastrous year, falling as it did on a population heavily in debt to the money-lenders, is the main cause of the startling loss of population disclosed by the census.

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The decrease in Belgaum is fully explained by the virulence of the plague epidemic, and in Bijapur it is probably due to losses on account of famine, especially in 1896-97, when the number of persons on the relief works was greater than in any other district. The returns of the Sanitation Department do not indicate a mortality sufficiently high to account for such a marked diminution in the population, but there can be no doubt of the severity of the famine.

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Central Provinces

The first census of the Central Provinces was taken in 1866 and disclosed a population of 9,236,983. Three years later came the famine of 1869, which touched with severity only the northern and eastern horders and caused an excess mortality estimated at about 250,000. Notwithstanding this disaster, the census of 1872 showed a small increase of 186,551 persons, the population then recorded being 9,223,534. In their fore-cast of the liability of the Province to scarcity, the Famine Commission of 1880, while admitting that the harvests as a general rule depended on the natural rainfall, went on to say that in the greater part of the country the rainfall had never been known to fail "and no part of India is freer from any apprehension of the calamity of drought than are the Central Provinces and Berar." By 1881 the population had risen to 11,548,511, or by 25.2 per cent., a considerable proportion of which may be ascribed to improved enumeration, especially in the Native States, which showed an increase of 63 per cent. The census of 1891 enumerated 12,944,805 persons, being 12.1 per cent. more than in 1881. Here again some allowance must be made for more accurate methods in the Native States, where the increase was 26.4 per cent. as compared with the more probable figure of 9.6 in British districts.

The event of the ten years preceding the last census have signally falsified the optimistic views of the First Famine Commission. A succession of bad seasons culminated in the first great famine of 1896-97, which was followed, after a single year's respite, by the widespread calamity of 1899-1900. Epidemics of cholera prevailed in seven years out of the period and malarial fever was on several occasions unusually frequent and severe. These disasters, coming upon a weakened and impoverished people, reduced their number to 11,873,029 persons, a decline of 1,071,776 or 8.3 per cent.

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For the first famine the returns of deaths are probably a good deal below the mark. In many districts the reporting officers, mostly illiterate village watchmen of the lowest castes, were greatly overworked, rural society was dis-organized by famine and cholera, and large numbers of people especially members of the wilder tribes, had left their homes and wandered away into the jungles in search of food.

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For the purpose of estimating the deaths directly and indirectly traceable to the second famine, the Famine Commission of 1901 take the decennial average of recorded deaths at 351,548 and deduct this from 539,234, the number of deaths registered in 1900. They thus arrive at 187,686 as the excess mortality of that year in British districts. If we follow their method and deduct the same decennial average from the number of deaths registered in 1896 and 1897 we get 424,195 as the excess mortality of the first famine, and 611,881 as the excess mortality of both famines in British districts alone. Adding 123,680 for Native States the abnormal mortality of the Province may be stated in round numbers at 735,000.

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If we compare for British districts the age distribution of 1891 and 1901, we find that among ten thousand of the population there were living on each of these occasions:—

	1901	1891	Variation
Persons under 10	2,632	3,068	—436
10 to 15	1,225	1,102	+123
15 to 40	4,102	3,745	+357
40 to 60	1,612	1,525	+87
60 and over	429	560	—131

The decline in the number of children and old people reflects the characteristic inroads of disease and scarcity upon the weakest members of the community. The increase in the proportion of persons between the ages of ten and sixty is mainly a consequence of the great diminution which has taken place at the two ends of the series. It does not follow, for example, that because the proportion of persons in the reproductive period from 15 to 40 is greater by $4\frac{1}{2}$ per cent. than in 1891, there is a similar preponderance in the actual number of people capable of bearing or begetting children. And recovery of the population from the wastage caused by famine is clearly dependent upon the absolute number of possible parents and not merely on their relative strength as compared with the proportion in the earlier and later age periods

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Madras :

The decline of population between 1871 and 1881 was due to the calamitous famine of 1876-78, and was far greater than would appear from a comparison of the census figures, which are estimated to have been deficient in 1871 to the extent of nearly 850,000

Since 1891 the conditions in Madras have not been favourable to a rapid increase of the population. According to Mr. Francis, "Plague checked trade and enterprise and there were three scarcities—in 1891-1892, in 1897, and in 1900. The first of these was most severely felt in the Deccan districts, especially in the Cumbum and Markapur taluks of Kurnool, and in the adjoining western taluks of Nellore. The second affected the Deccan Division again, and the Ganjam Vizagapatam and Godavari districts of the East Coast Division. The third was again worst in the Deccan (especially in Cuddapah) and the western part of Nellore, and also attacked the west part of Kistna adjoining. What the precise effect of each of these visitations was it is not easy to say. The Sanitary Commissioner concluded from the vital statistics that though no actual deaths from starvation were reported during the scarcity of 1897, the total diminution of population due to the famine conditions which then prevailed such a reduced birth-rate, increased susceptibility to ordinary disease among ill-nourished persons, and so on, was over 20,000 persons. Most of this loss was estimated to have occurred in the Deccan districts." It may be added that the above famines were less

severe in Madras than in many other parts of India. The worst was that of 1896-97, but thanks to the prompt measures of relief undertaken by the Madras Government and, in the case of the East Coast districts, to the fact that the previous four years had been years of plenty, the sufferings of the people were far less than they would otherwise have been

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The fact that the population has increased by as much as 7·8 per cent affords unmistakable evidence of the general well-being of the people and of their growing capacity to resist the evil effects of crop failure

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Punjab:

There was a famine three years before the census of 1855, and another eight years before that of 1868; the census of 1881 was taken twelve years after one famine and three years after another, but between 1881 and 1891 there was no such visitation. The rapid growth of population after a famine is well known, and it is thus easy to understand why the rate of progress disclosed at the censuses of 1868 and 1891, which followed periods of recovery from famine, should have been more rapid than in the thirteen years preceding 1881 when famine twice ravaged the country.

The conditions during the last decade are comparable to those of the interval between 1868 and 1881; there were two famines in both periods but those of the last decade followed each other with greater rapidity and there was thus less time for recuperation. The area affected by the failure of the monsoon of 1896 was very extensive, but the situation was improved by opportune rain in December, which facilitated the cold weather sowings, and there was severe famine only in a few districts in the south-east; viz., in Hissar, where it was most acute, and in those portions of the districts to the east of it, i.e., the districts round Delhi, which were not protected by the irrigation system of the Western Jumna Canal. The relief afforded was ample and, except in Hissar, the death rate in the affected tracts was little, if at all, above the average of the previous five years. There was a sudden rise in the mortality in Hissar and several other tracts at the close of the monsoon of 1897 but the Famine Commissioners of 1898 held that

it was due mainly to fever "of the ordinary malarial type... which always occurs when a year of heavy monsoon rainfall succeeds a year of drought" The number of deaths, however, "was increased by the enfeeblement of health which a prolonged period of privation had produced" There was also a very heavy mortality among cattle owing to the drying up of fodder supplies

The area which was affected by the weak monsoon of 1899 was much the same as in the previous famine, and Hissar again suffered most The death-rate of 1900 in all the famine districts was high, being more than double the decennial average, and in Hissar it rose to 96 per mille compared with an average of only 28 in the previous nine years Cholera, dysentery and diarrhoea, the characteristic diseases of famine years, were not specially prevalent and the great bulk of the deaths were attributed to fever The Famine Commissioners of 1901 found that "much of the mortality was due to an unusually unhealthy autumn acting upon a population predisposed to disease by privation" The general death-rate in this year was 47·7 per 1,000 which was higher than in any other year of the decade except 1892 when it was 49·5.

Central India.

The famine of 1877-79 intervened between the census of 1872 and that of 1881, the mortality from it and its attendant diseases, and from fever, was very high

In 1895 the monsoon ceased early in September and in the ensuing cold weather there was scarcely any rain The autumn harvest was in consequence 20 per cent below the average and that of the following spring yield barely three-fifths of the normal outturn The eastern districts and those in the Central India plateau, or British Bundelkhand, where the loss of successive spring harvests had weakened the staying powers of the people suffered most, and in the latter tract famine supervened The monsoon of 1896 was even more unsatisfactory than that of 1895 Up to the third week in August the general prospects were fairly good, but the monsoon gradually became weaker, and September and October were practically rainless. The rains of the ensuing cold weather, moreover, were not sufficient

to replenish the moisture in the soil The autumn and spring harvests were thus both very short and the two combined are estimated to have yielded barely half the normal outturn This led to severe distress in almost all districts, while in many there was actual famine The suffering was greatest in the Central India plateau and the Central Plain, in the south-west of the Western Plain, and in Jaunpur and Mirzapur.

It will suffice to say that the State enjoyed a full measure of prosperity up to 1899-1900 and that the shocking depopulation which has since taken place is due entirely to the ravages of the famine of that year

The loss of population is greatest in the Western States *ie.* in the elevated tract lying along the Arravalli Satpura and Vindhya ranges In several years the rainfall was deficient and the crops were poor This tract did not suffer from scarcity in 1897, but in 1899, an almost complete failure of the monsoon, following close on a deficient rainfall in the previous year, brought on a very severe famine, which was accompanied, as usual, by cholera and bowel complaints and a sort of paralysis attributed to the eating of a kind of wild pulse The mortality was very high, and resulted at the present census in a decrease of more than two-fifths in the population of the Malwa Agency, and of nearly the same proportion in that of Bhopal In the Indore Agency nearly a third, and in Bhopawar a sixth, of the population of 1891 has disappeared These figures, appalling as they are, have their counterpart in the adjoining States of Rajputana The least unsatisfactory figures in this tract are those for the Indore Residency, where the decrement is only 5 per cent, an amount sufficiently large in itself, but small in comparison with the enormous losses in the neighbouring States

Gwalior:

There was a severe famine in 1899-1900 The net loss of population during the decade was 13·2 per cent It occurred mainly in the elevated country in the south-west, in the Gwalior Prant to the north, three districts show an increase, and three a decrease of population, which, however, in no case exceeds 10 per cent

Hyderabad :

... Since 1891 the State had suffered from a succession of bad seasons and in only two years was the rainfall favourable to the crops. The western districts, which adjoin the Bombay Deccan, shared in the famine of 1896-97, the distress being greatest in the south-western tract which had suffered most severely in 1876-78. The evil effects of this famine were, however, slight compared with those of its successor of 1899-1900 which was most severely felt in the north-western districts, Aurangabad, Birh, Parbhani and Naldurg or Osmanabad

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That this famine is chiefly to blame is shown by the fact that practically the whole of the decrement has occurred in the tract where its ravages were mainly felt, which has lost nearly a fifth of the population that it contained in 1891

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in the region of sandy desert and scanty rainfall which forms the "North-West Dry Area". In 1895 the same tract obtained barely two-thirds of its ordinary rainfall and relief operations were started in Jaisalmer. The next season was also unfavourable and famine conditions spread into Bikaner, Marwar was affected by scarcity and there was also some distress east of the Aravallis, in Dholpur and Bharatpur, which lie in the "Indo-Gangetic plain, west". The rainfall was again deficient in 1898, while in 1899 the monsoon practically ceased towards the end of July, and the abnormal heat withered the grass and standing crops, dried up many of the irrigation tanks and wells, and brought on a famine more severe even than that of 1868-69

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Fever epidemics broke out in 1892, 1899 and 1900, the most virulent of all being that which followed the heavy rainfall of August and September 1900, which was aided in its ravages by the impaired vitality of the people

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However that may be, it is probable that the population at the beginning of 1899 was at least as great as in 1891, and that the whole of the decrease which has taken place is attributable to famine and disease during the two years immediately preceding the present census. It has been said that much of the loss is due to emigration, and it is well known that during the famine the relief works in the adjoining British territory were crowded with half-starved wanderers from Rajputana

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But even so, the losses owing to famine and its sequelae must exceed two millions, or, say 17½ per cent

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(11-c) Extracts from the All-India Census Report, 1911

Orissa Coastal :

Throughout the decade the seasons were less favourable to agriculture in this division. In 1907 and 1908 there were scarcity in all three districts—it was acute in Balasore, and in Puri it culminated in famine. The opening of the Bental Narpur Railway has greatly encouraged emigration. The net loss from this cause is 231,502 compared with 151,604 in 1901.

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(ii-d) Extracts from the All-India Census Report, 1931

...The monsoon of 1918 was exceptionally feeble and gave practically no rain after the beginning of September. In the Punjab and the Central and Western portions of the continent the crops failed over considerable areas and scarcity, aggravated by the high level of prices, was declared in parts of the Punjab, United Provinces, Central Provinces, Bombay Bihar and Orissa, while agricultural conditions were equally bad in parts of the Hyderabad and Mysore States.

Famine relief organisation is now so highly perfected in India that scarcity is not necessarily accompanied by high mortality.

These conditions lasted through the first half of 1919; ... an abundant though not very well distributed monsoon in that year brought some welcome relief, though prices remained high and it was necessary to stop all export of food grains and to reinforce the stocks of the country by importing wheat from Australia. The monsoon of 1920 was poor; the autumn rains failed and the winter rains were in defect. Famine was declared in one district in Bombay and scarcity in another district of that Province and in several districts of the Central Provinces. Famine conditions in Hyderabad were pronounced and distress prevailed in certain districts of Madras.

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Bengal:

...The Bankura district suffered twice in the decade from a failure of crops.

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Central Provinces and Berar

The monsoon again failed in 1920. Famine or scarcity was declared over a considerable area in the provinces and agricultural conditions had not recovered when the census was taken. There was considerable temporary migration from the east of the provinces to the mining areas of Chhota Nagpur, but the Superintendent thinks that the bulk of the migrants had returned by the date of the census.

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Madras:

There was a general failure of the south-western monsoon and a consequent contraction of the area under cultivation, the deficiency being most striking in the Deccan where dry cultivation was 78 per cent and wet cultivation 73 per cent

below the average of the previous five years. The situation was rendered worse by the delay in the north-west monsoon and cropped area fell in one year by nearly three million acres. The tracts worst affected were the East Coast (North) and the Deccan divisions and the districts of Chittor and Salem. In the Ganjam district there was severe distress over more than 1,000 square miles and the numbers in receipt of daily relief rose to over 150,000 in October, 1919.

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Punjab:

...The harvest of 1915-16 was poor and the economic and political difficulties arising from the war were beginning to be felt; the birth-rate began to fall and the death rate to rise. Disastrous harvests in 1918-19 were accompanied by a severe outbreak of influenza and increasing economic and industrial depression, and a further failure of the harvest in 1920-21 entirely disorganized the export market and left prices to the mercy of the local demand and supply.

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Hyderabad

The almost complete failure of the monsoon of 1918 resulted in widespread famine and scarcity in the State.

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(ii-e) Extracts from the All-India Census Report, 1931

....There has, however, been no serious famine in the decade under review.

...Improvements in communications, and consequently in ease of distribution, nowadays prevent anything like the famine mortality of a century ago, while taking India as a whole the decade ending in 1931 was a prosperous one in the matter of crops.

In Bengal there were floods, it is true, and floods proved to be the principal cause of local distress and scarcity during the decade in India generally, as no province completely escaped the inundation of some portion in the ten years under review. But taking India as a whole the first five years were generally above the average, or little below it. Famines were local and not very serious, though one unfortunate district in Madras had famine declared in it officially in three seasons.

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Part C—Plague, Cholera and Small-pox

(a) Extracts from the All-India Census Report, 1901

... it is necessary to refer to the check on the increase produced by the prevalence, in annually varying proportionate strength, of certain epidemic diseases. It is not easy to treat this subject otherwise than very generally, for the diagnosis of the village accountant or the local constable is very liable to error, and except in the hospitals and dispensaries, the classification of the causes of death leaves much to be desired. Small-pox and cholera, however, if, indeed we may call them epidemic in India where they are always present, are probably more correctly registered than most other fatal maladies. The symptoms are too well known and the disease, too, in both cases, is under the special control of a certain female divinity;.... The rest of the ills to which Indian flesh is heir to excepting accidents and snake-bite, mostly come on to the returns under the generic title of fever. Taking the return for what it is worth, we have had, during the past 10 years, a population under observation averaging about 197½ millions, with a mean annual number of deaths amounting to 5,140,000, which seems to indicate an omission of at least one in three. Of those registered, the 10 years' average includes about 309,000 deaths from cholera, yearly, with the maximum of 475,660; 126,750, from small-pox, the highest number being 333,380 and 3,397,300 from fever, with the corresponding limit of 4,110,000. Of the remainder, a number just short of a thousand is unclassified; and accidents and what are grouped under the head of bowel complaints account for the rest. Thus, to fever are attributed 66 per cent of the deaths, to cholera, 6; to small-pox 2; to bowel complaints, 5; and 21 to injuries and unclassified causes.

Cholera and small-pox are the two main causes of abnormal mortality in India, apart from famine and certain special outbreak of fever, which will be noticed below. Not a year passes without cholera in some part or another of the country, and there seems to be no sign of its becoming rarer or less fatal. In spite of all the sanitary precautions adopted, the outbreak is still a matter of chance, and once it happens there is no limit to its local extension. As to small-pox, though it cannot be said to have been

stopped by the greater prevalence of vaccination nowadays, it is said to be of a milder type in some parts of the country where it was formerly frequent and severe. The returns of blindness seem to indicate this to a slight extent.

Excluding a small tract in the Himalayas where it has long been endemic, bubonic plague made its first appearance in India in modern times in Bombay City in September 1896 and after spreading over the Western Presidency notwithstanding the measures taken to prevent its dissemination, gradually extended its ravage to other parts of India. By the date of the census the recorded mortality was nearly half a million, to which Bombay contributed seven-tenths and Bengal two-thirds of the remainder; Mysore with 33,731 reported deaths had suffered heavily in proportion to its population and so too had Baroda and Hyderabad. The extent to which the actual number of deaths exceeded that reported is uncertain, but it is known that the difference was very considerable and it may be assumed that the true mortality from plague was not less than three-quarters of a million and may possibly have been a million.

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Bihar :

... Purnea escaped the famine altogether, but it has sustained a loss of 3.5 per cent, or exactly the same as Champaran, where the decline is greatest in the very tract that suffered least from famine. Saran, which has a decrease of 2.2 per cent was far less severely affected than Muzaffarpur, which has gained 1.5 per cent and its loss of population is amply accounted for by the plague epidemic which was more virulent there than in any other district except Patna; the Gopalganj sub-division where the famine was worst has added slightly to its population of 1891. In Muzaffarpur and Darbhanga, the great rice-growing tracts under the Nepal frontier, which suffered most in the famine year, show the greatest growth of population. The decadent tracts in Muzaffarpur and Bhagalpur either escaped the famine altogether, or suffered from it only in a minor degree. The true causes of the decay in parts of North Bihar must, therefore, be sought elsewhere. Champaran and Purnea are well known to be unhealthy and have suffered since 1891, not only from malarial affections

but also from severe epidemics of cholera. The outbreak of this disease in Purnea in 1900 was of unparalleled severity and no fewer than 46,240 deaths were laid to its account in the annual returns of mortality. The part of Bhagalpur that has lost population borders on Purnea and shares the unhealthiness of which that district is the victim. In Saran, as already noted, plague fully accounts for the decrease which is greatest where that disease was most fatal.

South Bihar includes all the plague districts except Saran, and its decrease of 3.6 per cent is mainly attributable to the direct and indirect losses caused by the epidemic, $\frac{1}{12}$, a very heavy mortality, the flight of a great part of the immigrant population and, in some parts, the failure of the census staff to effect an exhaustive enumeration. Except in the west of Shahbad, the areas of greatest decadence exactly coincide with the areas that have suffered most from plague, and tracts that have been free from the disease have, as a rule, added to their population. Prior to the census the epidemic had been most virulent and most widespread in Patna, where the population has declined by 8.3 per cent as compared with 1891. The loss is greatest in the thickly populated urban and semi-urban country on the bank of the Ganges where the mortality due to plague was greatest. The southern part of the district which suffered least from plague has almost held its ground.

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Bombay :

Plague first appeared in Bombay City in September, 1896, and gradually spread all over the Province, especially in the Deccan and the south Maratha country, and in Thana, Cutch and the larger towns in Sind—Karachi, Hyderabad and Sukkur. The total registered mortality from plague up to the 1st March, 1901, the date of the census, was nearly a third of a million. The Superintendent has not given his opinion as to the extent to which these figures indicate the actual mortality, but it is well known that in the case of all serious outbreaks of epidemic disease the machinery for reporting vital occurrences becomes disorganised. The Plague Commissioners were of opinion that the true death-rate from plague was greater by at least 35 per cent than that actually reported, and in Bengal it has been estimated that the deaths from the

disease were more than twice as numerous as those shown in the returns, it would thus probably be safe to say that in Bombay the plague was responsible for a reduction in the population of from half to two-thirds of a million persons.

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Compared with the terrible ravages wrought in Gujarat by a single year of famine, the districts of the Deccan, which in the quinquennium between 1896 and 1900 endured two famines and suffered from short crops in the other three years, and which have also been smitten hard by the plague, show a wonderfully small loss of population. In Poona, Ahmednagar, and Satara, the decrement is from 6 to 7 per cent, but in the other districts it is considerably less. If it be conceded that the mortality from plague is double that actually reported, this alone would account for nearly the whole of the falling off in Poona and Satara.

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Mysore

The public health was fairly satisfactory until plague appeared in August 1898 and did great mischief. The total registered mortality from this cause up to the time of the census exceeded 35,000 of which more than half occurred in the cities of Mysore and Bangalore, including the Civil and Military Station.

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(b) Extracts from the All-India Census Report, 1911

On the whole, however, the decade might perhaps have been regarded as an average one from the point of view of the public health, had it not been for the ravages of plague, from which India had been practically free in recent times, until it broke out in Bombay in 1896. Spreading from that city it had already by March 1901 caused a recorded mortality of about half a million. Since then it has continued its ravages, especially in Bombay and Upper India. The mortality from it rose from about a quarter of a million in 1901 to 1.3 millions in 1907. It fell below a quarter of a million in each of the next two years, but in 1910 it exceeded half a million. The total number of deaths from plague during the decade was nearly 6.5 millions, of which over one-third occurred in the Punjab and two-fifths in the United Provinces and Bombay taken together. The disease fortunately has failed to establish itself in Bengal, Assam and

on the East Coast and in the extreme south of the peninsula. This moreover is only the recorded mortality. As is well known, when epidemics are raging the Reporting agency breaks down and a large number of deaths escape registration. The omissions are most numerous in the Native States, where registration is usually far less accurate than in British territory. A peculiarity of plague which has been noticed and explained elsewhere is that, in northern India at least, it attacks women more than men, and people in the prime of life more than the young and old. Consequently its after effects must shortly become apparant in a diminished birth-rate in the tracts most seriously affected.

Bombay Deccan North and Gujarat.

... During the greater part of the decade plague continued to be prevalent causing a registered mortality of 1.4 millions in Bombay Presidency.Kaira in Gujarat and Satara in North Deccan showed decrease in population due to Plague.

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North Bihar Plain and South Bihar Plain:

....The decrease of 4.9 per cent in Saran follows on a decrease about half as great as the previous census. These losses are due to plague, which was responsible for 166,000 deaths during the decade. There is moreover extensive emigration from this district.

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Mysore:

The agricultural conditions were normal and there has been marked progress in various Industrial undertakings. On the other hand there have been heavy losses from plague especially in towns; and malarial fevers have been prevalent in the Malnad or Western division. The net result of these opposing factors is the comparatively small increase.

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Madras Deccan:

The Deccan division is a landlocked area with no Industries; its red soils are poor, and though the black cotton soil found in many parts is fertile it is easily affected by drought as well as by excessive moisture. The Bellary district in

this division suffered badly both from plague and malaria.

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East, West and Central Uttar Pradesh.

The western, central and eastern divisions of the Indo-Gangetic plain, which all show a decrease, are amongst the most prosperous in the Province, but their death rate was abnormally high. The malaria epidemic of 1908 fell with special severity on the western while plague was the worst in the Eastern division. From the latter tract moreover there was extensive emigration. The districts which showed a loss of population were not only prosperous but also in normal years healthy. The malaria epidemic appears to have made most headway in those districts where the disease is not as a rule specially prevalent and least in those in which it is in a high degree epidemic.

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East Rajasthan Plain:

This division suffered most from Plague, fever and crop failure during the decade...

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Bombay Deccan Southern:

In Karnatak the population was stationary. Plague was the cause of decrease of population in Dharwar and Belgaum

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Punjab Plain & Pepsu:

The material conditions were all in favour of growth. Unfortunately except in the Western districts, the State of Public Health has been deplorable—Plague which first appeared in the Punjab in 1896, prevailed throughout the decade, and in British territory alone was responsible in all for about two million deaths of which nearly one third occurred in 1907. Malaria also has been terribly prevalent especially in the irrigated tracts in the eastern and central districts. It was worst in 1908 and the first three years of the decade. Altogether in British districts alone, four and a half million deaths from 'fever' were recorded.

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(c) Extracts from All-India Census Report, 1921

....1917....was wet and unhealthy and a virulent outbreak of plague in the north and west

of India caused heavy mortality . the deaths recorded are less than half that number (i. e. half of 6.5 millions of 1901-11). There were however serious outbreaks of plague in Bombay, the Punjab, the United Provinces and the Central Provinces in the first two years of the decade, the mortality was again high in 1915 and higher still in 1917 and 1918, when the disease was severe in practically every part of Northern and Central India. Cholera is normally most prevalent in the Eastern Provinces. It was specially virulent in Assam and in parts of Bihar and Orissa and Bengal, while in several provinces outbreaks of the disease either accompanied or immediately followed the influenza epidemic. Cholera in its most severe form has usually been associated with the deterioration in physique which accompanied famine conditions before famine organisation had been perfected. Virulent as the epidemic can still be when its hold is established it is now usually of a temporary and local nature, and the total death-rate in British India from the disease during the decade did not amount to more than 1.5 per cent.

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Assam

Though there was no plague, outbreaks of cholera and dysentery occurred in various districts. ..

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Bihar and Orissa

The first sign of trouble in 1918 was an acute outbreak of cholera in the hot weather, in that year over 200,000 deaths occurred from this disease

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Bombay.

Plague was specially virulent in the first year of the decade and in the years 1916, 1917 and 1918, but the total number of deaths from the epidemic in the decade was only about half the number of the previous decennium ...

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Punjab.

Mortality from plague in 1915 and from malaria and relapsing fever in 1916 and 1917 had already checked the natural growth of the population. .

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Uttar Pradesh

The decade opened with an unhealthy year (1911), in which there was a severe epidemic of plague responsible in itself for a mortality of 7 per mille. Cholera was prevalent and the fever rate abnormally high. The subsequent five years were normally healthy, but in 1917 malaria was more prevalent than usual and plague persisted into the summer months.

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The year 1918-19 is probably, in the matter of health, the worst on record. Apart from severe epidemics of plague and cholera, the province was devastated in the late summer and early winter by influenza.

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Influenza persisted in 1919-20 which was also a very unhealthy year. Though plague was negligible, there was a fairly severe epidemic of cholera, and a large proportion of the population had undoubtedly been left by the influenza epidemic of the previous year too weak to offer serious resistance to disease in any form. Public health was also unsatisfactory in 1920-21. The province was almost free from cholera and plague, but malaria was very prevalent.

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Hyderabad

Plague was prevalent throughout the period, causing a mortality of over 194,000 persons, while the death rate from cholera was heavy in several years.

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The city of Hyderabad which has three times during the decade been visited by plague has a fall in population amounting to 19.4 per cent.

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Part D—Malaria, Kala-Azar and Fevers

(i)—Extract from the Indian Famine Commission Report—1880

RELATION OF FAMINE MORTALITY TO NORMAL MORTALITY

There is no doubt not only that the general death-rate when compared with that of England is high, but that it is liable to far greater variations. The yearly death-rate of many Indian towns (where registration can be more exactly conducted than in the country) appears from the reports of recent years to have risen occasionally for many months together to rates varying from 40 to 100 per mille, and even higher. In the months of September and October 1879 a mortality was registered in the North-West Provinces which in some districts suddenly raised the death-rate from its ordinary total of about two or three per mille per month to nearly 40, and the ratio for the whole province for the month of October rose from 3.4 to 10 per mille. The abnormal mortality had not wholly ceased by the end of December 1879, and the effect of this was that in the district that suffered most the actual death-rate of the year 1879 rose from an average of 40 to 118 per mille, implying an increased mortality of 78,000 on a population of a million, and in the whole province, the actual mortality of the year rose from an average of 23 to 45 per mille, which indicates an increase of 924,000 deaths on a population of 42 millions. These rates are considerably in excess of those which have prevailed in districts suffering most acutely from famine. In the worst month of 1877 the death-rate only reached 49 per mille per annum for the entire Bombay presidency, and 60 per mille for the entire Madras Presidency. If special districts are compared, the highest rate in the worst month in the worst district of Madras was 13 per mille per month, and in the worst district of Bombay it was 12 per mille, in the two worst districts of the North-West Provinces in 1879 it rose to the extraordinary height of 37 per mille. Even these rates are exceeded by some which have been reported at times in some towns of the Punjab. It is certainly to other causes than a deficiency of food that such mortality must in many cases be referred. In 1879, in the districts just referred to, no scarcity whatever existed, prices throughout the whole country were moderate, the autumn harvest had been exceptionally good, and the mortality was attributed by the sanitary authorities to a severe outbreak of malarial fever.

We are therefore forced to conclude that the population of India is exposed continually to destructive agencies, which under more favourable conditions might be regarded as preventable, but against which society has at present neither the means nor the knowledge necessary to secure its protection. Large numbers of the people live in so primitive a condition, irrespective of anything that can properly be called poverty, as to render them liable to disease against which, they have no effectual remedy or defence. Epidemics may sweep them off by tens of thousands without attracting attention, because these agencies are incessantly at work. Famine, which intensifies their activity, is more conspicuous from its less regular recurrence, but it is really only one and perhaps not the most deadly, of numerous influences by which at present human life among the people of India is cut short, and which can be effectually counteracted only by the general advance of society in wealth, knowledge, and material resources.

(ii-a) Extract from the All-India Census Report, 1891

... Fever ... includes a variety of diseases, amongst others, influenza, in the form in which it was prevalent during the past three years. There are, however, certain classes of fever that seem confined to special localities, which they ravage for a few years, and often disappear as unexpectedly as they broke out. For instance, in the Brahmaputra valley of Assam, the "black sickness" (kala-azar), that broke out some years since, has been peculiarly destructive to life along the southern bank and has also crept across to few tracts on the northern bank. For some time it baffled medical research, but its nature was thoroughly investigated in 1890 by a competent expert, who found the disease to be largely due to the insanitary habits of the villagers. The name he proposed for it was parasitic anaemia, or anchylostomiasis. Whatever it may be, its results are painfully apparent in the two districts where it has been rife for the longest period, and the provincial Superintendent of the Census attributes to it a loss of over 100,000 people during the decade. Another instance of epidemic fever is that popularly known as the Burdwan outbreak, from the name of the district where it was specially prevalent some years ago. The tract, however, has obtained this bad eminence unjustly, for it seems that the disease originated further in the

delta, about Midnapur, where it is attributed to the water-logging consequent on the choking of the natural drainage channels of this part of Bengal, by reason of the gradual changes in the course of the main estuaries . . . and affects the returns of four large districts. It is not only in the lower part of the Gangetic basin that water-logging has occurred. In the south east of the Punjab the natural drainage has been obstructed to some extent, and portions of the Karnal and Delhi District have passed out of popular favour, apparently for good sanitary reasons . . . (In) the case of the southern portion of the Ganges Doab, however, there does not seem to have been so much an increase of mortality as the abandonment of the soil because it deteriorated for agricultural purposes. Along the borders of the Tara, or sub-Himalayan forest and grazing tract in Rohilkhand on the other hand, fever has increased in prevalence during the last decade or so, though it is not said to be of so special a type as that of Burdwan or Assam . . . In other parts of the country there have been outbreaks of fever due to some local cause, such as that in Amritsar in the Punjab, where the city population fell off by 11 per cent, whilst the rural tracts surrounding it continued to increase. In other cities, too, the malady we now call "influenza" grew to the intensity of an epidemic, and carried off numbers of the inhabitants in the few weeks . . .

The spread of vaccination, though uneven, is doing much to mitigate the ravages of small-pox. Cholera, which it seems impossible to prevent altogether, is localised by segregation, or by the strong measure of prohibiting religious gatherings, whenever they are likely to lead to an outbreak of this scourge, and in all such cases the sanitary arrangements of the locality are placed under the control of special superintendents. As for normal disease, every year sees an increase in the number of dispensaries, which are, in fact, small hospitals under trained men, scattered about the rural tracts, whilst in larger towns the lower grade medical practitioner, turned out by the Universities, is growing in popular favour against the rivalry of the herbalist and exorciser.

(u-b)—Extracts from All-India Census Report, 1901

Assam.

... In the centre of the Brahmaputra Valley two districts are conspicuous for a decrease in

their population. Nowgong has lost 86,147 people, or nearly 25 per cent of the population recorded in 1891, while Kamrup has declined by 45,062 or 7 per cent. In both cases the chief cause of the decrease is the virulent and communicable form of malaria known from the darkening of the skin which is one of its symptoms, as *kala-azar* or the black sickness. This disease, which is probably identical with the Rangpur and Burdwan fevers and the *kala-dukh* or *kala-jwar* or *Pumes* and the Darjeeling terai, was first observed in the Garo Hills in 1869, when the Garos were so impressed with its infectious character that they "are said to have not only abandoned their sick, but to have stupefied them with drink and then set light to the houses in which they were lying in a state of helpless intoxication." By 1883 it had spread to the Goalpara sub-division which showed a decrease of 29,699 persons at the census of 1891. Five years later *kala-azar* entered Kamrup and reduced the population of the southern part of the district by nearly 12 per cent. Having spent its force there it passed on, in 1892, to Nowgong where its track is marked by deserted villages, untilled fields, all land revenue reduced by 23 per cent and a disheartened population which, after 19 years of steady increase, has now receded to the figure at which it stood nearly 30 years ago. There can be little doubt that *kala-azar* has done much to retard the natural development of Assam.

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Bengal:

The decline of nearly 3 per cent in West Bengal during 1872-81 was caused by the epidemic of Burdwan fever which ravaged the alluvial tracts of the division and was estimated at the time to have caused about two million deaths besides materially impairing the reproductive capacity of the population.

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In Western Bengal the increase is 7 per cent, varying from 13 per cent of natural growth in Burdhum, which is recovering from a cycle of malaria, to 1.4 in Hooghly, where fever is rife and the population would have been stationary but for the influence of the mills and factories of Serampur.

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In the earlier part of the decade the rainfall was excessive and badly distributed, and not only

caused serious damage in many parts to the crops, but also led to a severe outbreak of malarial fever, which in 1894, raised the death-rate to an exceptional height and sapped the vitality of the people to such an extent that the birth-rate in 1895 was unusually low

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(u-c) Extracts from the All-India Census Report, 1911

. In the decade which has just ended epidemics of malarial fever decimated the irrigated tracts of the Eastern and Central Punjab and the Ganges-Jumna Doab in the United Provinces, where in 1908 alone the reported mortality from "fevers" was nearly two millions

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Assam.

. In several years there were Cholera epidemics hut on the whole the public health was satisfactory *Kala-azar* has disappeared and there has been no plague

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Bombay-Konkan :

The net increase in Konkan was only 2 per cent There was a decrease in Kolaba due to emigration to Bombay city and in Kanara due to Malaria

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Punjab Plain and Pepsu.

The material conditions were all in favour of growth Unfortunately except in the Western districts, the State of Public Health has been deplorable Plague which first appeared in the Punjab in 1896, prevailed throughout the decade, and in British territory alone was responsible, in all for about two million deaths of which nearly one-third occurred in 1907 Malaria also has been terribly prevalent especially in the irrigated tracts in the eastern and central districts It was worst in 1908 and the first three years of the decade Altogether in British districts alone, four and a half million deaths from "fever" were recorded.

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(u-d) Extracts from the All-India Census Report, 1921

By far the largest number of deaths in India are entered under the category of "fever", and allowing for inaccuracy of diagnosis it has

usually been assumed that about two-thirds of the deaths so recorded may be ascribed to malaria Recent investigations made in special areas, however, suggest that this proportion has been considerably over-estimated and that malaria only accounts for from one-fifth to one-fourth of the number of reported fever cases, the remainder being cases of dysentery, pneumonia, phthisis and other diseases Malaria is endemic in large areas of the continent, both in the forest-clad country which fringes the mountain ranges and in tracts of Bengal, Assam and Burma, where the configuration of the country prevents the drainage of the flood-water after the monsoon In such areas, besides raising the average level of the death-rate, it permanently lowers the vitality of the people and reacts both on the birth rate and on their general economic condition In parts of western Bengal the population has been described as sodden with malaria Epidemic malaria was specially severe in the Punjab and United Provinces in the earlier years of the decade and again in 1917 when, owing to the specially heavy monsoon, mortality from this disease was high in almost every province In the last few years the prevalence of an affection which is the cause of considerable mortality called Relapsing Fever has received considerable attention by the Health Department This disease has been diagnosed as common in most parts of the country, specially in the Northern Provinces and in the Central Provinces and Berar and Bombay, but the extent of the mortality which can be ascribed to it cannot at present be estimated Nor can figures be given of phthisis which is undoubtedly responsible for considerable mortality; especially in the towns of western India, the deaths from this disease in Ahmedabad amounting in 1918 to 5 per mille of the population All other factors in the health of the people have, however, been overshadowed by the influenza epidemic of 1918 and 1919 which has dominated the population figures at the present census

* * * * *

Assam

There was a recrudescence of *kala-azar* during the decade .

* * * * *

Bengal.

Malaria was specially severe throughout the period, which was characterized by a low birth

rate and a mortality which in several districts steadily exceeded the number of births . .

* * * *

(u) Extract from the All-India Census Report, 1931

every year sees improved methods of fighting such epidemics as cholera, plague or 'Kala-azar'. Indeed a completely effective treatment for the latter pest has been perfected since the last census, and has made it possible to stamp

out the disease. The antimony treatment of 'Kala-azar' was discovered as early as 1913, but the original treatment took three months to apply and therefore did little to prevent the epidemic. The treatment with organic antimony compounds, introduced about 1917, reduced the period of treatment to a month. The improved treatment introduced during the 1921-31 decade however cures the disease in ten days or even less.

* * * *

Part E—The Great Influenza Pandemic

Extract from All-India Census Report, 1921

The Influenza Epidemic of 1918 invaded the continent of India in two distinct waves. The first infection apparently radiated from Bombay and progressed eastward from there, but its origin and foci are uncertain. It may have been introduced from shipping in Bombay during May, and there is a suggestion of some sort of mild influenza in the Bombay district, Delhi, and Meerut in the spring, but the existence of the disease in epidemic form cannot be established without doubt before June. The disease became general in India in both the military and civil population during August, and infection spread rapidly from place to place by rail, road and water. The first epidemic was most prevalent in urban areas, but it was not of a specially virulent type and, probably for that reason, it is said to have affected young children and old people most severely. The mortality curve went to a peak in July and then dropped, and there is evidence of a distinct interval between the first and second waves but not of any real break of continuity, as sporadic cases were reported throughout the intervening period. It is impossible to say where the more virulent virus of the second invasion came from. There are certain facts which suggest that the disease began in the Poona district in September. It appeared from province to province, lasting in a virulent form generally from eight to ten weeks, when mortality, usually due to respiratory disease, reached highest point. The rural areas were most

severely infected, the reason probably being that while villages have little advantage over towns in the matter of overcrowding, sanitation and ventilation the urban areas have the benefit of qualified medical aid and organised effort. Mortality was specially high among adults (20-40), particularly among adult females, the disease being generally fatal to women in pregnancy. It is suggested that the high mortality among women may have been due to the fact that, in addition to the ordinary tasks of the house, on them fell the duty of nursing the others even when themselves ill. The figures show that the excess mortality between the ages 20 and 40 amounted in some cases to nearly four times the mean. It is no exaggeration to say that at the worst period whole villages were absolutely laid desolate by the disease. There was sometimes no means of disposing of the dead, crops were left unharvested and all local official action was largely paralysed, owing to the fact that the majority of the official staff was put out of action by the epidemic. To add to the distress the disease came at a period of widespread crop failure and reached its climax in November when the cold weather had set in, and, as the price of cloth happened at the time to be at its highest, many were unable to provide themselves with the warm clothing that was essential in the case of an illness that so readily attacked the lungs. The disease lasted in most provinces well into 1919 and gave a high mortality in that year in Bengal and the United Provinces. Even after it had subsided there were in the Central Provinces, Bombay and Burma mild recrudescences later in

the year, while local outbreaks continued over the country during the next two years

It is not possible to explain the peculiar variations in the local prevalence of the disease which seems to have been entirely capricious in its incidence. The coast line escaped with a low mortality while in the hilly country the disease was usually specially fatal, though this was apparently not always the case in the Punjab. The Eastern Provinces escaped lightly and Calcutta was not attacked as severely as other cities. It has been suggested that the mortality was determined by the comparative liability of the people to respiratory complications, or, in other words, their susceptibility to pneumonia, and it looks as if the epidemic was more virulent in a cold dry climate than where there was comparative warmth or humidity.

There is no direct means of ascertaining the mortality from the epidemic. Influenza was unknown to the registration staff as a specific form of illness and the deaths were entered

Province	Estimated number of deaths	Death-rate per mille of population of col 2
Ajmer-Merwara	20,835	59.5
Assam	111,340	18.6
Bengal	386,572	8.5
Bihar & Orissa	709,976	20.5
Bombay	1,059,497	54.9
Burma	137,491	13.9
C.P. & Berar	924,949	66.4
Cowp.	2,014	11.5
Delhi	23,612	56.6
Madras	682,169	16.7
N.W.F. Province	89,035	43.6
Punjab	898,947	45.4
United Provinces	2,034,257	43.4

under the heads fever or respiratory disease. Various estimates have been made based on the excess mortality over some suitable mean. The average of these calculations gives a total number of deaths in the areas under registration of about 7,100,000 in 1918, as shown in the marginal table; to which must be added, as the results of similar calculation, another 1 1/3 million deaths in 1919, giving a total recorded mortality of nearly 8 1/2 millions in the two years. Even thus, however, must be a substantial under-estimate since, owing to the complete breakdown of the reporting staff, the registration of vital statistics was in many cases suspended during the progress of the epidemic in 1918 and when the time came to reconstruct the figures the number of omissions, especially in the case of women, must have formed a high proportion. In some cases the Census Superintendents give estimates of deaths considerably higher than those given in the margin, which are taken from the Sanitary Commissioner's Report. There is a difference of nearly 4 millions between the census figures and the deduced population, a considerable proportion of which must be due to omissions of influenza deaths. In any case the figure given above applies only to the areas under registration, which contain little more than three-quarters of the population of India. The epidemic was especially virulent in the Rajputana and Central India Agencies and in the States of the Punjab, Central Provinces and Bihar and Orissa, while the attack was severe in Kashmir and Mysore and acute in Hyderabad and parts of Baroda. We have no statistics for these areas, at any rate none that are trustworthy, but a rough estimate would put the direct mortality, in them, from the disease in 1918 and 1919, at least in the same proportion as in British territory. We thus arrive at a total mortality of between 12 and 13 millions for India. It is interesting to note that even this conservative estimate of a mortality, the large part of which occurred in the space of three or four months, exceeds by nearly two millions the total estimated deaths from plague extending over 20 years (1896-1918), and is a good deal more than double the death-rate directly attributable to the famines of the period 1897-1901. The number of deaths, however, is not, of course, the measure of the loss of life from the epidemic. The case mortality has been put roughly at about 10 per cent and on this basis the total number of persons affected by the disease was about 125 millions or two-fifths of the total population of India.

Part F—The Bengal Famine 1943

Extract from Inquiry Commission Report on Bengal, 1945

B—THE CAUSES OF THE BENGAL FAMINE

* * * * *

4 The crisis in Bengal which culminated in the famine began by the end of December 1942. The shortage of supplies developed rapidly in Greater Calcutta and became acute in March 1943. The measures taken by the Government of Bengal and the Government of India succeeded in averting a catastrophe in Greater Calcutta. At the same time distress was developing more slowly but steadily in other parts of Bengal, and successive efforts to avoid disaster failed. Famine raged over large areas in the province and came to an end only with the reaping of the *aman* crop in December 1943.

5. On a review of all the facts which we have set out in earlier chapters, we are led to the following conclusions about the causes of the Bengal famine —

I During 1943, there was a serious shortage in the total supply of rice available for consumption in Bengal as compared with the total supply normally available. This was due to

- (A) a shortage in the yield of winter rice crop (*aman*) of 1942, combined with
- (B) a shortage in the stock of old rice carried forward from 1942 to 1943

II Out of the total supply available for consumption in Bengal, the proportionate requirements of large sections of the population who normally buy their supplies from the market, either all the year round or during a part of the year, were not distributed to them at a price which they could afford to pay.

This was due to

- (A) The incapacity of the trade operating freely in response to supply and demand, to effect such a distribution in the conditions prevailing, and
- (B) The absence of that measure of control, by the Bengal Government, over producers, traders, and consumers in Bengal necessary for ensuring such a distribution.

III The supply of rice and wheat which, under normal conditions, would have been available to Bengal from sources external to the province, was not available during the closing months of 1942 and the early part of 1943. This was due to

- (A) The loss of imports of rice from Burma, and
- (B) The delay in the establishment of a system of planned movements of supplies from surplus provinces and states to deficit provinces and states

* * * * *

4 While the Commission cannot accept popular views on mortality, it is nevertheless of the opinion that the official figures under-estimate the total number of deaths. In rural Bengal, as elsewhere in India, the primary collector of mortality statistics is a village functionary to whom deaths are reported by relations of the deceased in the village. The village chowkidar* (previous to 1944), reported deaths to the Union Board Office, whence by several stages the records ultimately reached the office of the Director of Public Health. The chowkidar also reports the cause of deaths. In normal times the system scarcely lends itself to scientific accuracy and in 1942 and 1943 other factors making for errors and omissions were introduced. In certain places the salaries of chowkidars were not paid and they deserted their posts to obtain work on military projects and aerodromes. During the famine chowkidars were not immune from starvation and disease and some of them died. The replacement of dead and the vanished chowkidars was no easy matter and several weeks or months might elapse before successors could be found, during which deaths presumably went unrecorded. Further, in the height of the famine thousands of people left their homes and wandered across the countryside in search of food. Many died by the roadside—witness the skulls and bones which were to be seen there in the months following the famine. Deaths occurring in such circumstances would not be recorded in the statistics of the Director of Public Health.

* The Chowkidar or village watchman is a permanent village servant, usually illiterate, and paid about Rs 6 or Rs 7 a month.

7 In spite of the conditions produced by the famine, there was no universal breakdown in 1943 in the system of recording deaths. We made careful inquiries on this point from local officials and other witnesses. After due consideration of the available facts we are of the opinion that the number of deaths in excess of the average in 1943 of the order of one million—that is, some 40 per cent in excess of the officially recorded mortality. We have found no valid reason for accepting estimates in excess of this figure. On the other hand, the high excess mortality in 1944 must be added to the toll of mortality. On this basis we must conclude that about 1.5 million deaths occurred as direct result of the famine and the epidemic which followed in its train.

* * * * *

HEALTH PREVIOUS TO THE FAMINE

1 In normal times, malaria, cholera, and small-pox are endemic in Bengal and serious epidemics of these diseases are of recent occurrence. The state of nutrition of a considerable section of the population was poor. The same can of course be said of many other parts of India. The calamity of famine fell on a population with low physical reserves and circumstances were favourable for a flare-up of epidemic disease. The association between health conditions in normal times and the high famine mortality must be underlined.

* * * * *

LACK OF FOOD

2 A high proportion of the deaths which took place in the early stages of the famine can best be described as deaths from starvation. It is true that disease of some kind or other was usually present in starving patients, adding to the seriousness of their condition. Very commonly such patients suffered from "famine diarrhoea", often seen as an uncontrollable diarrhoea which led to dehydration, rapid weakening and death. Other kinds of disease were also frequently present in starving destitutes. There was a considerable excess mortality from malaria and cholera as early as July, 1943. The difference between death from simple starvation and death

occurring in a starved individual who is suffering from disease is of medical interest, but a negligible difference when the broad facts of famine mortality are under consideration.

3 We can perhaps roughly distinguish between two phases of famine mortality and disease. During the first months of the famine the emphasis was on starvation, with or without coincident disease, a cause of death. At a somewhat later stage, epidemic diseases took precedence over starvation. The peak in cholera mortality occurred in October and November, 1943, while in the case of malaria December stands out as the worst month. By the end of the year, with the reaping of the *amhar* crop and the provision of food to the famine victims through the medium of relief kitchens, etc., deaths from sheer starvation diminished. When this stage was reached the main medical and public health problem became that of epidemic disease, notably malaria. But even when relief measures had been in operation for some time, and adequate supplies from the province as a whole were available, the recovery of sections of the population from under and malnutrition was slow, and survivors belonging to the classes affected remained in a poor state of health. Throughout the famine, the provision of suitable nourishment to patients in famine hospitals was of primary importance in treatment, although it was in the early stages that the problem of resuscitating cases of starvation by suitable therapeutic measures was most acute.

DISEASES IN CALCUTTA FAMINE HOSPITALS

4 Epidemic diseases were prevalent among famine victims in Calcutta as in other parts of Bengal. For example, investigations carried out in Calcutta towards the end of 1943 showed that some 40 per cent of destitute patients harboured malaria parasites. In general the picture seen in the Calcutta emergency hospitals from August to November, 1943 was that of acute starvation and its effects. Many of the patients in the hospitals were picked up on the streets in a state of extreme weakness and collapse, often on the point of death. They were for the most part emaciated to such a degree that the description "living skeletons" was

justifiable. Weight was often reduced by as much as one-third of the normal, that of men who normally weighed 120 to 130 lbs fell to 80 to 90 lbs. When this degree of emaciation is reached as Alexander Porter points out in his book "The Diseases of the Madras Famine of 1877-8", "life is held by a slender thread which the least untoward circumstance is sufficient to snap"

6 The exact causes of so-called "famine diarrhoea" are at present unknown. When the famine was at its worst, famine diarrhoea was perhaps the most formidable problem with which the medical relief agencies had to deal

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EPIDEMICS

13 Severe epidemics of malaria, small-pox and cholera were associated with famine

The malaria season in Bengal normally extends from July to December. A severe and widespread epidemic, beginning in June, occurred during the latter half of 1943, reaching its peak in December and continuing in 1944. From July to December 1943, 479,039 deaths from malaria were recorded, an excess of 266,208 deaths (125.1 per cent) over the quinquennial average. In the first 6 months of 1944, malaria mortality figures were of the same order, 400,901 deaths were recorded which was 223,664 deaths (126.1 per cent) above the average. Excess deaths from malaria accounted for 41.5 per cent of excess deaths in 1943 and 53.0 per cent of excess deaths from January to June 1944. In December 1943, the reported deaths from Malaria were 202.6 per cent in excess of the quinquennial average.

APPENDIX V
SHORTAGE OF FOODGRAINS

APPENDIX V

Shortage of Foodgrains

PART A—Note on Production, Consumption and Shortage of Foodgrains in India—1951

OUR STATISTICS of the yield of crops are based on the independent determination of two factors: (i) cultivated acreages and (ii) estimates of yield per acre of different crops. An explanation of the merits and defects of the former will be found in the introductory note to APPENDIX I. The determination of the latter, *viz.*, yield per acre, is based ultimately on the assessment made by very large numbers of primary reporters—village accountants (where these exist) and *shaukidars* (where village accountants do not exist). They assess the condition of the crop shortly before the harvest, and record their assessment not in absolute quantities—in maunds, tons etc.—but in '*amas*' which are relative proportions of an assumed 'normal' crop. The average of these proportions is then struck for tehsils, districts and higher territorial units, and the *amas* are translated into absolute quantities at the headquarters of State Governments.

2 As in every system, there are possibilities of error. These are mainly of two types. One type of error may arise at the source. What is 'normal' is not fixed quantitatively for the guidance of the primary reporter. He is, therefore, estimating the proportion of an unknown, and though, in general, his concept of the unknown is steady, it may not always be so. Again, his smallest unit of estimation, the '*ama*' may be anything between one-eighth and one-twelfth of a 'normal' crop, which is rather a large unit; and, in practice, he might ordinarily assess in terms of multiples of *two* *amas* rather than an *ama*. It is frequently said that the primary reporter is prone to systematic under-estimation, but there is no real evidence in support of this statement. The chances are that errors occur in either direction on a purely random

basis, and since there are a very large number of primary reporters, the absence of systematic bias should be counted as a merit of the system.

A more important type of error might arise at the stage of translation of the average '*ama*' values into tons; for, at this stage, 'systematic errors' may be introduced by adopting a 'standard yield rate' for each district which may be too high or too low. The rates are, in fact, fixed after very careful enquiries. Two different departments of every State Government usually co-operate in carrying out crop-cutting experiments, which yield the data necessary for the purpose. In recent years, an important improvement has been introduced. At the instance of the Statistical Section of the Indian Council of Agricultural Research, crop-cutting experiments are organised under adequate technical system, on a random sample lay-out. The results are helping to provide a rough dimensional comparison, but they have not yet reached a stage at which they may be related to the basic data and a single set of firm estimates with a determinate margin of error can be furnished. So much for data relating to production of foodgrains.

3 There are no data about grain consumption to provide a systematic time-series for defined areas—similar to acreage and yield statistics. There are only fragmentary results of special enquiries made at different times, in different places, by different agencies.

There are considerable variations in the rates between the sexes, among different age-groups, between villages and towns, among people working in different avocations, among

people living in different climates, and among people having different dietary habits. Again, it is probable, though this is less firmly established, that there is a slightly larger rate of consumption in years following good crops and a slightly smaller rate of consumption in years following poor crops. It is also likely that, when population increases, the relative proportion of population groups having different rates of consumption does not remain the same, but changes. In view of all this, the determination of average rates of grain consumption is subject to very much greater uncertainty than the birth-rate, the death-rate or the yield-rate of foodgrains per acre.

4. In our present state of knowledge, it is not possible to assess our shortage of foodgrains either for the country as a whole or for a state or a district by direct computation of production and consumption and subtraction of the former from the latter. The reason is that no one can be sure of any estimate of consumption within a margin of error of say, 10 to 15 per cent. Likewise, no one can be sure about any estimate of production, within a margin of error of say, 5 to 10 per cent. But since it is reasonably certain that the shortage of all foodgrains does not exceed 10 per cent of the production of all foodgrains, we cannot possibly say—by reference merely to estimates of production and consumption—whether there is a shortage at all and if so, of what order. One other complication should also be mentioned. All foodgrains produced are not eaten by human beings. Some are sown again as seed. A little is fed to cattle. There is wastage at various points between the field and the kitchen. [Some grain may be used for starch-making or distillation but this is negligible.] We do not have a firm idea of the magnitude of these factors. Thus, there is a definite shortage of relevant information. This does not mean that the shortages cannot be (or are not) assessed with sufficient accuracy for enabling practical decisions to be taken. The statistics for import, export, or transport by rail are available for a long period. Statistics of the 'State trading system' and the working of ration shops are available for nearly ten years. When these statistics are interpreted by the authorities who are actually responsible for distribution of food, correct judgments are reached. Thus we have figures of three different types—each of which presents its own difficulties and defects—and

we have to piece them together in order to form the best possible judgment.

5. Among the papers in Part E of this APPENDIX there is a statement which shows the operation during the calendar years 1949, 1950 and 1951 of state trading in foodgrains. It shows that on the average 43.0 lakhs of tons were annually procured from all parts of India; 34.8 lakhs of tons were annually imported, and 77.1 lakhs of tons were annually issued from government stocks (to ration shops and other distributing agencies operating under government control). The difference between issues and procurement (77—43) 34 lakhs of tons per annum is the best measure of the average actual level of shortage of foodgrains in India. It is arguable that it is not a good measure for any of the following reasons:

- (i) Three years is a short period for an average—and the crop may have been subnormal. If so, the true shortage may be less.
- (ii) There may have been a build-up of private stocks during the three years outside the state trading system. If so, the true shortage may be less.
- (iii) There may have been compulsory overprocurement of stocks which, under the given crop conditions, would normally have been retained unsold by producers. In that case, the true shortage may be more.
- (iv) The consumption under the rationing system may have been smaller than it would normally have been under free trading conditions. In that case, the true shortage may be more.

In the last resort it is a matter of opinion. Having regard to the persistence with which prices rise whenever and wherever free trade is extended, it seems to the present writer that the average level of the true shortage—round about 1951—was probably somewhat higher than 34 lakhs (but not perhaps as high as say, 40 lakhs). We have got figures showing the statewide distribution of government stocks. On the basis of

these figures, the zonal break-up of shortage* of foodgrains may be estimated as shown below :

TABLE I

Zone	Foodgrain shortage per annum	
	(IN LAKHS OF TONS)	(IN LAKHS OF MAUNDS)
North India	1.9	52
East India	6.9	188
South India	9.9	270
West India	10.5	287
Central India	0.9	25
North-West India	1.8	49
Zonally unspecified	2.2	60
INDIA	34.1	931

The uncertainties mentioned above, about the equivalence of true shortage with the balance of issues and procurement apply to each zone separately, more strongly than to India as a whole. But there can be no manner of doubt that West India and South India have a very well-marked and substantial deficit, East India has a smaller

but nevertheless significant deficit ; and that these three zones account for well over three quarters of India's shortage of foodgrains

6 On an average of 5 years preceeding 1951† the area of cultivated land in India was 2,867 lakhs of acres. More than one crop was raised on 377 lakhs of acres. In the result, the total 'gross area sown' was 3,241 lakhs of acres. This was made up of 743 lakhs of acres under rice, 396 lakhs under *jowar*, 209 lakhs under *bajra* and so on ; altogether making up a total of 2,526 lakhs of acres under 'all foodgrains'—this term being taken to include all the staple foodgrains as well as gram and pulses—but not including groundnut, gingelly or any other oilseeds. Reduced to 'per capita' terms, India cultivates 79 cents per capita. Reckoning the area sown more than once, the gross area sown per capita is 90 cents. Out of this area foodgrains are grown on 70 cents per capita.

The following table shows the break-up of the area of cultivated land, gross area sown and foodgrain cultivation among zones—as well as the corresponding 'per capita' figures

Table 2

Zone	Lakhs of Acres			Per Capita (cents)		
	Cultiva- ted land	Gross area sown	Foodgrain cultiva- tion	Cultiva- ted land	Gross area sown	Foodgrain cultiva- tion
North India	393	489	426	62	77	67
East India	525	624	541	58	69	60
South India	404	458	318	53	61	42
West India	501	517	366	123	127	90
Central India	691	742	559	132	142	107
North-West India	353	413	316	90	105	80
INDIA	2,867	3,243	2,526	79	90	70

7 The official‡ estimates of production of foodgrains during the period of five years (1947-48 to 1951-52) were averaged separately for rice, wheat, *jowar*, *bajra* and all other foodgrains,

and divided by the corresponding average acreage. Average yield rates were thus obtained zone by zone. Then an allowance for seed was deducted

* The figures represent the excess of 'off-takes' from government stocks, in each zone over the 'procurement' in that zone on an average during the three years 1949, 1950 and 1951.

† It is usual to refer to the estimates based on village returns described already as 'official' estimates in order to distinguish them from other estimates based on special enquiries.

‡ Figures for cultivation acreages are taken from 'Statistical Abstract of India', Crop section, India—estimates for 5 years 1947-48 to 1951-52, the base for 'per capita' being the average for 5 years 1947-48 to 1951-52.

at the following percentages of yield, viz rice (6.8), wheat (14.0), *jowar* (3.5), *bajra* (3.3) and all other foodgrains (7.5). [These deductions were based on information available with the

Directorate of Economics and Statistics of the Ministry of Food and Agriculture] The results are shown below :

TABLE 3

(IN LAKHS OF MAUNDS)

Zone	Average yield of foodgrains					Total food-grains	Deduct for seed all food-grains	Estimated annual yield (less seed of all food-grains)
	Rice	Wheat	Jowar	Bajra	All other food-grains			
North India	540	714	144	154	1518	3070	249	2821
East India	2952	112	5	..	1140	4209	263	3946
South India	1350	..	301	134	968	2753	131	2622
West India	305	115	464	216	316	1416	80	1336
Central India	786	275	592	36	1021	2690	181	2509
North-West India	101	603	62	126	725	1617	167	1450
INDIA	6014	1819	1568	666	5688	15755	1071	14684

We now proceed to consider what, if any, corrections are required in the figures of the last column of this table in order to allow for errors in the estimation of yields

Among the papers of APPENDIX I, there is a full statement furnished by the Statistical Section of the Indian Council of Agricultural Research showing what may be called the verified samples estimates of yield-rates as ascertained by random sample crop-cutting and comparing them with corresponding rates based on official estimates. We may review the results of this comparison

8. Rice yield rates :

UTTAR PRADESH (all divisions except Himalayan) . Official estimates are higher than the verified sample estimates, more or less consistently, in nearly all divisions by over a maund per acre

BIHAR : The verified sample estimates are now adopted in recent years as basis for official estimates.

ORISSA (COASTAL) : Official estimates are consistently lower by about two maunds per acre.

MADRAS (all divisions except Madras Deccan) Official estimates are consistently higher in North Madras and West Madras and lower in South Madras, except for one year in one division—the differences are generally very small

BOMBAY (all divisions except Greater Bombay) : The results are variable. We see official estimates closely agreeing, being definitely higher, and being definitely lower—with more or less equal frequency. On the whole, the averages are probably in agreement

MADHYA PRADESH (North-West & East) . There is no systematic difference in North-West Madhya Pradesh. In East Madhya Pradesh, the official estimates are consistently lower than verified sample estimates. The defect is variable and may change about a maund per acre.

9 Wheat yield rates :

UTTAR PRADESH (all divisions) . The official estimates are consistently higher than the verified sample estimates in Himalayan Uttar Pradesh. The other divisions show no definite trend.

Whether we compare different divisions for the same year, or different years for the same division, we find instances of official estimates exceeding verified sample estimates and *vice versa*. The differences also are not large.

BIHAR. Verified sample estimates are adopted in recent years as the basis of official estimates.

BOMBAY (The two Deccan divisions and Gujrat): Official estimates are consistently higher than verified sample estimates in both the Deccan divisions and there is no definite trend in Gujrat. The differences are very small.

MADHYA PRADESH (all divisions). More often than not the official estimates tend to be a shade higher in East Madhya Pradesh and a shade lower in North-West Madhya Pradesh and South-West Madhya Pradesh. The differences are small and variable.

PUNJAB (both divisions). The official estimates tend to be lower than the verified sample estimates fairly consistently in the Plains. The difference varies from about half a maund per acre to about a maund per acre.

to Jowar and Bajra yield rates. Random sample crop cutting has been carried out in three divisions of Bombay and three divisions of Madhya Pradesh.

BOMBAY. There is no indication of systematic difference between the two sets of estimates. The official estimates are sometimes higher, sometimes lower and sometimes in close agreement. This applies both to *jowar* and *bajra*. The differences are variable and not large.

MADHYA PRADESH. The same may be said about Madhya Pradesh also, in respect of *jowar*. There are no verified sample estimates for *bajra*.

11. Yield rates in Rajasthan: The foregoing review exhausts the areas and crops for which the results of random sample crop cutting carried out under the guidance of Indian Council of Agricultural Research are available. The only other important area for which the results of random sample verification are available is

Rajasthan. The verified sample estimates (which relate to one year only) are reported to exceed the official estimates consistently. The excess is reported to be large; it varies with the crop and is highest for *bajra*—an important crop. Competent local officers are of opinion that the official estimates understate the true yield by 40 to 50 per cent.

12 The foregoing review indicates that the official estimates may be a shade overpitched in Uttar Pradesh, somewhat underpitched in the Punjab and Orissa, and more substantially underpitched in Rajasthan and substantially right in Madras, Bombay, Madhya Pradesh and Bihar. There is very little justification for the view, often expressed, that the official estimates have been intentionally underpitched in order to evade grain procurement obligations.

On the information available, no corrections are called for in respect of South India, West India and Central India. Slight adjustment might be necessary in North India and East India, but the differences are too small and too uncertain to support any definite figure as a correction factor.

A correction factor is, however, clearly needed in North-West India, in view of the findings about all crops in Rajasthan and as well as about wheat in the Punjab. It is suggested that an overall increase of North-West India yield-rates by 30 per cent might be assumed to be the correction indicated by the evidence. [This is roughly the mean between 10 per cent applicable to one half of the yield and 50 per cent applicable to another half of the yield in this zone. This is obviously little better than an *ad hoc* working hypothesis, to be revised on the basis of more refined data when available.] In the result, the official estimates of yield—set out in Table 3 in para 7 above—require to be increased by 435 lakhs of maunds of all foodgrains in North-West India, as well as the country as a whole.

13 We may now compute the total production of foodgrains (yield less seed) in absolute quantities, and by adding the assessed shortages from Table 1, we may also get the estimates of total consumption of foodgrains. From these, we may deduce the *average rate of production per acre, as well as consumption per capita*.

TABLE 4

Zone	Lakhs of tons		Rate of	Rate of
	Production (yield less seed)	Consumption (yield less seed)	production (yield less seed) in maunds per acre	consumption per capita in maunds per annum
North India	104	106	6.6	4.6
East India	146	153	7.3	4.6
South India	96	106	8.2	3.8
West India	49	60	3.6	4.0
Central India	92	93	4.5	4.8
North West India	69	71	6.2	5.0
INDIA	556	590*	6.0	4.5

The figures of Table 4 are about as far as we can get on the basis of 'official estimates' in our search for correct figures of 'production rates per acre' and 'consumption rates per capita'. The production rates per acre, it should be noted are exclusive of seed. The consumption rates per capita include in addition to actual human consumption, small and unknown additions on account of wastage and cattle feed also.

14 It must be pointed out that the figures of rates of consumption per capita set out in Table 4 do not agree with the figures published recently in the report on the 'First Round' of the National Sample Survey. According to Table (X) at page 78 of this report, the rate works out to 5.0 maunds for India against 4.5 in Table 4. The rates for the zones differ as follows: North-West India—6.9 against 5.0, North India—5.7 against 4.6, East India—5.1 against 4.6, South India—4.5 against 3.8, Central India—4.5 against 4.8, and West India—3.8 against 4.0.

It is not possible to express any confident opinion as to which set of rates is nearer the truth. They help to indicate the limits within which the truth is most probably to be found. Even more important—they underline the need for forming a correct judgement about the extent of shortage of foodgrains independently on the basis of the actual experiences of so-called 'food controls'—our nationwide system of 'state trading' in foodgrains with the reliable statistics about supplies and prices which have accumulated by the operation of this system for nearly ten years. We should not be misled by the uncertainty which necessarily surrounds estimates of average yield rates and average rates of consumption.

PART B—Supply and prices of foodgrains

(i) Extract from the Indian Famine Commission Report, 1880

The quantity of grain and pulse exported touched its highest point in 1876-7, when it reached 26,210,000 cwts, and had fallen to 22,887,000 cwts. in 1878-9. The two chief items are rice and wheat. The export of rice has varied from 17½ million cwts, in 1874-5 (the year following the Bengal Famine) to 21½ millions in 1878-9. The export to Europe amounts on the average to 11,600,000 cwts, that to Mauritius, the Cape and other colonies to 2,400,000 cwts, and the balance is taken by Arabia and Persia. Wheat reached its highest figure, 6½ million cwts, in 1877-8, and fell to one million cwts, in 1878-9, which is about the quantity exported in 1874-5 before the increase began.

* * * * *

[156] The following figures (though they are but approximate and rough estimates made from data which we hope soon to see more accurately established) indicate that the ordinary out-turn of food in British India exceeds 50 million tons, and the ordinary surplus available for storage, for export, or for the luxurious consumption of the richer classes is more than 5 million tons.

[Figures in Thousands]

Province	Population	Food Crop	Out-turn	Area under
		Area	of food	Non-food
		Acres	Tons	Acres
Punjab	17,600	18,500	5,390	2,500
N W Provinces and Oudh	47,000	37,450	11,230	5,200
Bengal	60,000	48,000	17,100	
Central Provinces	8,200	12,000	2,750	2,500
Berar	2,250	3,700	620	2,800
Bombay	16,000	21,500	4,500	5,500
Madras	31,000	26,000	8,500	2,500
Mysore	5,000	5,200	1,500	500
Burma				
TOTAL	181,350	166,350	51,590	21,400

ORDINARY CONSUMPTION

[Figures in Thousand Tons]

Province	Food	Seed	Cattle Feed	Wastage	Total	Surplus
Punjab	3,800	390	250	270	4,710	620
N W Provinces and Oudh	8,420	820	830	500	10,570	660
Bengal	13,000	1,000	1,000	900	15,900	1,200
Central Provinces	1,660	460	180	150	2,450	300
Berar	400	30	80	30	540	80
Bombay	9,300	290	260	210	4,150	350
Madras	6,300	400	440	420	7,560	940
Mysore	1,700	60	50	75	1,285	215
Burma						800
TOTAL	37,980	3,450	3,090	2,555	47,165	5,165

The figures in the last column show the estimated annual surplus from which the several provinces, if free from drought, could supply the deficiency in provinces suffering from famine. Experience indicates that the largest area with which we may have to deal in a single year is

not likely to exceed the tract affected in 1867-77, the total population of which was about 36 millions. It is estimated that in that year the crop in Bombay was short of the average by $1\frac{1}{2}$ million tons, in Madras by $3\frac{1}{2}$ millions, and in Mysore by 1 million tons, and the difference between this estimate of the out-turn in these provinces and the quantity required for a year's consumption at the ordinary rate is $4\frac{1}{2}$ million tons. But the deficit actually to be met will be sensibly less than this amount. For a calamity of this kind immediately leads the population to reduce its ordinary rate of consumption both for men and cattle, and to guard more carefully against the waste that usually occurs. So far, too, as land remains unsown during the drought, something is saved in seed grain. From these causes the above stated deficit of $4\frac{1}{2}$ million tons might be reduced to 3 millions. To meet this the local stocks, which there is reason to believe may commonly suffice for not less than three months consumption of the local population are first drawn upon, and as they begin to be depleted prices rise high enough to attract supplies from distant parts of the country. When the imports from without into a famine area are very large, as in the case of 1876-77, there is a corresponding rise of price and check of local consumption established in the exporting districts also, and thus, partly by enforced economy in these districts also, and partly by the contribution of their local surplus stocks, the pressure is spread over a wide extent of country in a greater or less degree. There would thus be available to meet the estimated deficit of 3 million tons, first, the local stocks of the distressed area, which, taken at three months' supply of the people's food, amount to $2\frac{1}{2}$ millions; second, the year's surplus of the districts not affected, which, by the figures in the above table would be $3\frac{1}{2}$ million tons, but which might be expected to be larger in consequence of the diminished consumption; and third, the local stocks in those districts; and these three sources of supply, taken together, would appear to be quite sufficient to provide what was required. The yield per acre, on which the foregoing estimate is based, is derived from the local detailed reports and is so moderate that we have no doubt that it can be maintained, or may be readily increased, and it is important to observe that the surplus which we believe to be sufficient to meet the deficiency of food consequent on the severest drought on record, or likely to occur, does not exceed 6 per cent of the total present produce of the country.

We are unable to place confidence in the Table which shows an estimated annual surplus yield of five million tons of food grain. *The average annual export of rice and grain from all India is one million tons, which should thus leave four million tons to be laid by, a quantity sufficient to feed 24 millions of people.* As famines come but once in 12 years, there should in that period be an accumulated surplus sufficient to feed nearly 300 millions. And yet when famine does come, and then affecting at its worst not more than a tenth of that number, it is only by immense pressure on other parts of India, and at a quadrupled price that the barest sufficiency of supplies can be obtained. Thus seems a clear proof that the alleged surplus must be greatly overestimated. Considering, also, the admittedly "approximate and rough estimates" on which the belief in this surplus is based, and the exhausting practice of agriculture so generally followed in the cultivation of dry grain in India, we are unable to concur in the statement that "India as a whole now produces, and is likely long to produce, sufficient food for its population

in any season of drought". The "prolonged teachings of the past" referred to in the Report are, as far as that country is concerned, wholly against such a conclusion. Population is increasing, the price of food is rising, the production of it as shown by exports scarcely advances, whilst, as the number of the landless class who depend on wages is constantly growing, the supply of labour in the absence of industries other than agriculture must soon exceed the demand. Already their wages bear a less proportion to the price of food than in any country of which we have knowledge. The common price of grain in the Southern States of America on which the free black labourer is fed, is the same as that of the Indian labourer, viz., 50 to 60 lbs per rupee. But his wages are eight times that of the Indian 2s to 2s 3d, against 3d a day, whilst the climate is much the same in its demands for clothing and shelter. This is a fact of extreme gravity as illustrative of the poverty of the Indian-coolie or field labourer, not to be met by resting satisfied that "chronic famine is one of the diseases of the infancy of nations." For India as a nation has long passed its "infancy", and the task of the British Government is, by fostering diversity of occupation to guard it against decline.

PART C--Estimates of rates of consumption of foodgrains

(i) Extracts from the Indian Famine Commission Report, 1880.

The conclusion we draw from a careful examination of the evidence of authorities in all parts of India is, that on an average a ration of about 1½ lbs per diem of the meal or flour of the common coarser grain of the country suffices for an ordinary working adult male. In the rice-eating countries an equal weight of rice may be accepted in lieu of flour and in any case the ration should include a suitable proportion of pulse. A man doing light work would require about 1½ lbs, and the ration which consists of 1 lb of flour with a little pulse has been found sufficient to support life in numerous relief-houses, where no work is exacted, all over the country. On these basis the diet scale should be built up, it being understood that a female requires a little less than a male, a child below twelve years of age about half the allowances of an adult male, and a non-working child below six or seven about half as much as a working child. On relief works, however, where a money wage

is given, the rate of pay should be such as to leave a slight margin above the actual cost of the flour so as to allow for the purchase of salt, pepper, and other condiments and firewood and to avoid the risk of the wage being insufficient to purchase the full ration of food. Whenever it is necessary to supply people with a kind of food to which they are unaccustomed, the result should be carefully watched, and endeavour should be made to counteract, by some adjustment of the dietary, the unfavourable results which will probably arise from the change.

(ii) Extract from the Proceedings of the Government of India in the Revenue and Agricultural Department No. 35/33 dated Simla, the 24th August, 1893.

(Appendix II to the Indian Famine Commission Report, 1880)

The grain-equivalent of the minimum wage . . . It is open to Local Governments either to prescribe the calculation of wages in the manner indicated by section 130 of the Provisional

Code or to adopt the alternative method, described in the last part of the preceding paragraph, subject to the following instructions

The grain selected as a basis for calculation should in every case be the staple or staples in ordinary consumption in the affected tracts, and not the more expensive classes of grain which, though occasionally consumed in times of plenty, are abandoned for cheaper grains as soon as pressure sets in. After a careful review of the statistics indicating the relations existing at various times in each Province between the price of the staple grain and the prices of other items of the ration, the Governor General in Council is satisfied that the cost of the other items in the minimum adult male ration will seldom, if ever, be found to be more than $\frac{1}{2}$ of the cost of the grain item. The value of the minimum ration for an adult male will therefore be found to be fully represented by $1\frac{1}{2}$ lbs. of the grain or grains ordinarily consumed, and this estimate allows for a moderate 'margin' above a subsistence ration. The grain-equivalent of the ration thus estimated should not be exceeded in the rules of any Code without further reference to the supreme Government.

Wages in terms of the grain-equivalent expressed in pounds

Taking the standard rate laid down in the preceding paragraph as a basis of calculation, the wages prescribed for the various classes of relief-workers are as follows

ADULT MALES—

Maximum	Class A—The money value of $2\frac{1}{2}$ lb of grain
	Class B—The money value of $2\frac{1}{2}$ lb of grain
	Class C—The money value of 2 lb of grain
	Class D—The money value of $1\frac{1}{2}$ lb of grain
Minimum	All classes—The money value of $1\frac{1}{2}$ lb of grain

ADULT FEMALES—

Maximum	Class A—The money value of $2\frac{1}{2}$ lb of grain
	Class B—The money value of $2\frac{1}{2}$ lb of grain
	Class C—The money value of $1\frac{1}{2}$ lb of grain
	Class D—The money value of $1\frac{1}{4}$ lb of grain
Minimum	All classes—The money value of $1\frac{1}{4}$ lb of grain

CHILDREN—

Wages or allowances for children will be determined on a consideration of their ages, their powers of work, and their requirements. The wages or allowances should not be less than one-quarter or more than three-quarters of the wages allowed for adult males

(iii) Extracts from the Famine Inquiry Commission Report on Bengal, 1945.

[4] Rates of consumption of Cereals—(i) Standards (per adult and per capita)—The standard advised by the Government of India for purposes of rationing, and generally followed throughout India, is one pound a day per adult. The standard adopted in the rationing of Calcutta is 4 seers per week per adult, equivalent to 19 ounces per day. These standards are not based on ascertained actual consumption. It is generally assumed that the consumption of 100 persons of all ages is equivalent to that of 80 adults. On this basis, the standard rates of per capita consumption are 80% of those of adult consumption.

(ii) Actual off-take of Greater Calcutta under rationing—The average weekly off-take, on the basis of 22 weeks actuals, was 5,529 tons of rice and 3,562 tons of wheat and wheat-products, or 9,091 tons in all. The number of registered ration card holders in Greater Calcutta was 4.10 millions. Of these 3.36 millions are adults, 0.68 million are children entitled to a half ration, and the rest are infants not entitled to any cereal ration, in other words, the total in terms of adults is 3.70 millions. If these figures represent the actual population, then the actual average off-take would be as follows

Average off-take	In seers per week	In ounces per day
Per adult	2.68	13
Per capita	2.41	11

But the number of registered ration cards cannot safely be assumed to be equivalent to the number of the total population, for the former include "dead cards" which, though registered are not used. The proportion of "dead cards" among those registered with Government stores is 16 per cent and it is believed that the proportion is smaller among cards registered elsewhere. Hence the actual average off-take is somewhere between the figures given above and those given

below which are obtained by multiplying the figures by 100/84

Average off-take	In seers per week	In ounces per day
Per adult	3 20	15
Per capita	2 87	14

(iii) *Estimates furnished by Professor Mahalanobis*
Honorary Secretary, Indian Statistical
Institute, Calcutta—Professor Mahalanobis has analysed the results of five different surveys conducted at different times between 1936 and 1942. Some of these were made at the instance of the Bengal Government and others were undertaken by the Indian Statistical Institute or the Visva-Bharati Institute of Rural Reconstruction. The following estimates, relating to the consumption of cereals, are based on his report:

	In seers per week	In ounces per day
	3 58	17
	3 65	17
	2 79	13
	2 75	13
	3 47	16
	2 95	14

families whose monthly
was 3,212 as against a total
of 16, and the number of
as 11,786 as against a

Many other estimates
which need not be
were reviewed by the
Committee appointed
it during 1944. Thus
to the wide divergence
it concluded that the
assumption in the prob-
ably higher than 4 seers
as view is accepted, the
than 3 20 seers per
;

General average.—
to permit of conclusions
; It is probable that

the true average rate is somewhere between the following limits:

Per capita consumption	In seers per week	In ounces per day
Lower limit	3 2	15
Upper limit	3 6	17

(b) *Sectional averages*—The rate of consumption of cereals is higher in the villages than in the towns and cities and higher for the working classes than the middle classes

(vi) *Under-nourishment*—A low rate of cereal consumption does not necessarily mean under-nourishment. The figures supplied by Professor Mahalanobis show that the relatively lower rates of cereal consumption of the urban middle classes are associated with relatively higher rates of consumption of protective and supplementary foods. But the figures for "families whose monthly expenditure is Rs. 10 or less" indicate a cereal consumption rate of 14 ounces per day with a very low rate of consumption of other foods. This class, which accounts for one-seventh of the total number, is probably under-nourished even in normal times. It is probable that the actual proportion of the population which is under-nourished in normal times is larger than one-seventh, but precise information on this point is not available.

[5] *Direct Estimates of Annual Consumption*.—If, as mentioned already, the probable rate of consumption per head per week is anything between 3 2 seers and 3 6 seers, the probable annual consumption of a population of one million during one year might be anything between 153,000 tons and 172,000 tons. As the population of Bengal during 1941 was (according to the census) 60 3 millions, the probable annual consumption of the province may have been anything between 9 2 million tons and 10 4 million tons during 1941. The elements of uncertainty inherent in any estimate of total consumption of the province during any particular year include the following:

- There is a range of error of over one million tons, arising out of the uncertainty about the average rate of consumption.
- The population of Bengal during 1941 may have been less than the census figure of 60 3 millions. If the true figure was smaller by as much as, say

3 millions, the figure of consumption would have to be reduced by nearly half a million tons.

- (c) An estimate of consumption for any earlier or later year depends on an allowance being made for the increase of population. This might, in view of the doubts mentioned already, be anything between 0.7 per cent per annum and 2 per cent per annum.
- (d) For the following reasons it cannot be assumed that an average rate of consumption per head remains constant over a series of years.
- (i) The proportion of the population which is under-nourished in normal times may be increasing. There is, however, no means of determining the effect of such a change on total consumption.
- (ii) The poorer classes in rural areas, whose standard of consumption is normally low probably reduce their consumption in lean years and increase it in years of good harvest. Likewise the urban poor increase their consumption in periods when the prevailing level of wages and employment rises more rapidly than the price of cereals, and decrease it when the opposite occurs. It is, however, not possible to make any satisfactory allowance for such variations, because neither the numbers of the classes whose consumption may vary for these reasons, nor the range of the variation is known.

It may thus be concluded that the information available is such that any estimate of the annual consumption of the province based on population statistics and an assumed average rate of individual consumption is likely to err by as much as 2 million tons—or about 25 per cent of the estimate. So wide a margin of error blocks this method of approach.

(iv) Extract from Draft Memorandum on Human Nutrition *vis-à-vis* Animal Nutrition in India.

(By the Nutrition Committee of the Indian Medical Research and the Animal Nutrition

Committee of the Indian Council of Agricultural Research, 1952.)

On the basis of utilising the maximum potentiality of cultivable acreage, adoption of scientific methods of increased crop production, and taking into cognisance certain barriers which can be overcome only in due course, we can expect to achieve the following modified target of human requirement within a reasonable period

TABLE VI

A modified scale of human diet which can be achieved under the new plan

Foodstuffs	Daily requirements in ozs	
	Recomm- ended	Attainable
Cereals and Millets	14	14
Gram and pulses	3	3
Green leafy vegetables	4	4
Root vegetables . . .	3	3
Other vegetables . . .	3	3
Fruits	3	3
Milk	10	(a) to oz. over what exists to-day, for 20 per cent of the population (i.e., the vulnerable group)
		(b) what exists to-day for the rest of the population
Sugar and Jaggery	2	2
Vegetable oil and Ghee	2	1½
Meat	1	1 At present 55 per cent of population only
Fish		Not considered in the present plan
Eggs	1	No Not considered here

(v) Consumption of Foodgrains per person per day

Surveyal	No. of sample households	Consumption per person per day	
		dihataks	ounces
1	2	3	4
URBAN			
Middle class			
1 Calcutta middle class 1939	1,151	6.5	13.4
2 Bengal urban middle class 1942	981	6.3	13.0
3 Calcutta middle class 1945	610	6.7	13.8
4 Calcutta middle class 1950-51	774	6.4	13.2
Working class			
5 Jaraiddal working class 1941	641	8.6	17.7
6 Jaraiddal working class 1942	740	8.2	16.9
7 Jaraiddal working class 1945	755	6.8	14.0
	9,038	8.4	17.3
	659	7.2	14.4
	181	8.4	17.3
		10.2	21.0
		9.6	19.7
	450	10.2	21.0
	(61)*		
		8.4	17.3
		7.9	16.3
	1,881	8.3	17.1
	3,177	8.9	18.3

PART D

Import and Export of Food Grains in relation to India's Foreign Trade

(i) Extracts from the Indian Famine Commission Report, 1880.

Grain.—The quantity of grain and pulse exported touched its highest point in 1876-77, when it reached 26,210,000 cwts., and had fallen to 22,887,000 cwts., in 1878-79. The two chief items are rice and wheat. The export of rice has varied from 17½ million cwts., in 1874-75 (the year following the Bengal famine) to 21½ millions in 1878-79. The export to Europe amounts on the average to 11,600,000 cwts., that to Mauritius, the Cape, and other colonies to 2,400,000 cwts., and the balance is taken by Arabia and Persia. Wheat reached its highest figures, 6½ million cwts., in 1877-78, and fell to one million cwts., in 1878-79, which is about the quantity exported in 1874-75 before the increase began.

Comparison of Indian trade with that of England.—The trade of India at the present time approximates in its general amount to what that of Great Britain was between 1830 and 1840, but the difference that the Indian exports show a large excess over the imports, a condition of British trade which finally ceased about 1825, after which year imports began to prevail more and more, until at length they exceeded the exports by the enormous value of 150 or 160 millions sterling, though now the excess is somewhat less.

Excess of exports due to investment of capital and to cost of administration.—Supposing the values to be tolerably correctly recorded in the trade returns, which is believed to be the case, the excess of the value of exports over imports indicates the entire sum which India has to send to England to pay for all charges connected with the administration, the interest on English capital invested in India, and the profits of private trade and savings from salaries remitted by Englishmen, minus the new capital sent out from year to year for investment in the country. The period from 1854 to 1869 was the time when the capital for the guaranteed railways was being raised; about 110 millions were borrowed or raised in England 30 millions for the purposes of the Government, and 80 millions subscribed as railway capital for investment or expenditure in India, and there was hardly any surplus of exports at this time. In 1869 the construction of

guaranteed railways was coming to a close, and the system of construction by the State was beginning and from that time India, instead of drawing large sums of capital from England for investment, had to pay many millions a year as interest. The great rise in the export trade dates from that time, and for the last ten years the excess of exports has averaged about 16 millions sterling, of which perhaps half may be regarded as the return on capital invested in railways and commercial enterprise, and half as the charge on account of the administration of India by England which has to be met in England.

Imports into India.—The principal imports are cotton twist and piece goods, coal, liquors, and metals. The following table shows the average annual value for the last five years of such imports as exceed 500,000 in the year.

	£
Cotton twist and manufactures	18,895,000
Metals	3,265,000
Liquors	1,336,000
Coal	1,835,000
Sugar	1,819,000
Woollen goods	780,000
Railway plant and rolling stocks	757,000
Silk goods	747,000
Silk, raw	653,000
Apparel	565,000
Salt	556,000

Cotton goods.—The cotton goods imported are chiefly twist and piece goods. Of cotton twist, the average value has been about 2½ millions sterling, the import has shown no tendency to increase of late, the production of the coarser qualities by the Indian mills being very large. In piece goods the kinds called grey goods largely predominate; the average value for five years has been 10,460,000.

Metals.—Of the metals imported 80 per cent. is iron; and copper is the next most important item.

Liquors.—Under the head of liquors the imports whether of beer, spirits, or wines, show a tendency to decrease; the diminution in the case of beer being mainly due to the growing production of the hill breweries.

Silk.—About 2 million lbs. of silk, valued at 6½ million rupees, and about 7½ million yards

of pure and mixed silk goods, valued at nearly a rupee a yard, were imported from China and Japan.

Coal.—The use of English coal (of which on an average 460,000 tons were imported) is falling off in Bengal, where coal mining is largely developed, but is increasing in Bombay, where the cotton mills are creating a new demand for it, the deposits in Central India being too far off to supply it at a sufficiently low price.

Sugar.—Sugar comes mostly from Mauritius and China, and goes to Western India; the imports are fluctuating in amount, the export trade, chiefly from Bengal, is of almost equal value. This is an article which, if a little more skill were shown in its production and manufacture,

India could at least supply to meet its own wants

Exports from India.—The average value during the last five years of principal articles exported from India has been as follows:

	£
Opium	12,175,000
Cotton, raw	11,515,000
Cotton, manufactured	905,000
Grain and pulse	7,963,000
Oil seeds	5,210,000
Jute, raw	3,201,000
Jute, manufactured	663,000
Hides	3,095,000
Indigo	2,973,000
Tea	2,579,000
Coffee	1,432,000
Wool	1,036,000

(1) Quinquennial Averages of Imports and Exports of Foodgrains in India.

Year	[Thousand Tons]		
	Imports(—)	Exports(+)	Balance
1	2	3	4
1890-91—1894-95	—209	+1,445	+1,236
1895-95—1899-1900	—482	+1,098	+616
1900-01—1904-05	—624	+1,663	+1,039
1905-06—1909-10	—959	+1,478	+519

Source K L Datta An enquiry into the rise of prices in India, Vol I

1915-16—1919-20	—1,186	+1,587	+401
1920-21—1924-25	—1,135	+977	—158
1925-26—1929-30	—1,593	+828	—765
1930-31—1934-35	—1,843	+571	—1,272
1935-36—1939-40	—2,072	+686	—1,386
War Years			
1940-41—1945-46	—808	+298	—510

Source Ministry of Food and Agriculture,
Directorate of Economics and Statistics

—3,272 —3,272

(iii) (a)—Net Exports and Imports of Foodgrains into India—1891-92 to 1911-12.

[Thousand Tons]		[Thousand Tons]	
Year	Net Imports (+) Net Exports (—)	Year	Net Imports (+) Net Exports (—)
1	2	1	2
1891-92	—2,157	1902-03	—892
1892-93	—1,424	1903-04	—2,018
1893-94	—910	1904-05	—2,910
1894-95	—807	1905-06	—1,300
1895-96	—1,057	1906-07	—745
1896-97	—286	1907-08	—720
1897-98	—147	1908-09	+481
1898-99	—1,457	1909-10	—877
1899-1900	—399	1910-11	—1,659
1900-01	+609	1911-12	—2,994
1901-02	—250		

Source: K. L. Datta: An enquiry into the rise of prices in India, Vol. I

(iii) (b) — Imports and Exports of Foodgrains into and from India.

[Thousand Tons]			
Year	Imports	Exports	Net Imports (+) Net Exports (—)
1	2	3	4
Part I—(Undivided India including Burma)			
1890-91	12	2,557	—2,545
1891-92	26	3,319	—3,293
1892-93	15	2,245	—2,230
1894-95	24	2,164	—2,140
1895-96	15	2,383	—2,368
1896-97	53	1,591	—1,538
1897-98	54	1,544	—1,490
1898-99	3	3,071	—3,068
1899-1900	75	2,224	—2,157
1900-01	98	1,641	—1,543
1901-02	28	2,185	—2,157
1902-03	13	3,162	—3,149
1903-04	7	3,859	—3,852
1904-05	4	5,100	—5,096
1905-06	31	3,359	—3,328
1906-07	26	2,938	—2,912
1907-08	29	3,077	—3,048
1908-09	95	1,735	—1,640
1909-10	25	3,291	—3,266
1910-11	11	3,930	—3,919
1911-12	10	5,118	—5,108
1912-13	9	5,515	—5,506
1913-14	19	4,195	—4,176
Part II—(Undivided India excluding Burma)			
1914-15	1,283	1,434	—151
1915-16	1,318	1,470	—152
1916-17	1,056	1,682	—626
1917-18	567	2,953	—2,386

(iii) (b)—Imports and Exports of Foodgrains into and from India

[Thousand Tons]

Year	Imports	Exports	Net Imports (+) Net Exports (-)
1	2	3	4
Part II—(Un-divided India excluding Burma)—contd			
1918-19	938	1,557	- 619
1919-20	2 049	274	-1,775
1920-21	1,292	611	- 681
1921-22	1,744	422	-1,322
1922-23	965	783	- 182
1923-24	839	611	+ 228
1924-25	834	2,457	-1,623
1925-26	1,228	875	- 353
1926-27	928	766	- 162
1927-28	1,927	1,009	- 918
1928-29	2,219	885	- 1,334
1929-30	1,662	693	- 1 059
1930-31	1,409	765	- 644
1931-32	1 592	618	- 974
1932-33	1,341	520	- 821
1933-34	2,589	466	-1,623
1934-35	2,782	488	-2,294
1935-36	2,215	422	-1,793
1936-37	1,965	720	-1,245
1937-38	1,596	966	- 630
1938-39	1,872	828	-1,044
1939-40	2,714	493	-2,221
1940-41	1,519	556	- 963
1941-42	1,222	779	- 443
1942-43	86	378	- 292
1943-44 (a)	58	86	- 28
Part II (a)—On Government account (Un-divided India excluding Burma)			
1943-44 (b)	326		- 326
1944-45	726		- 726
1945-46	931		- 931
1946-47	2,578		-2,578
Part II b.—On Government account (Un-divided India excluding Burma and Pakistan).			
1947-48	2 656		-2,656
1948-49	3 017		-3,017
1949-50	2,861		-2 861
	2,720		-2,720

(iv) Index Number of Prices (1925-26 to 1929-30 as base)

Quinquennial average prices		Quinquennium	Paddy (Madras 1800-1952)
1		2	3
112	.	1800-01 to 1804-05	28.9
114		1805-06 to 1809-10	29.3
106	. . . . .	1810-11 to 1814-15	27.2
86		1815-16 to 1819-20	22.1
113	.	1820-21 to 1824-25	29.0
93		1825-26 to 1829-30	23.9
106	. . . . .	1830-31 to 1834-35	27.2
100	. . . . .	1835-36 to 1839-40	25.7
71		1840-41 to 1844-45	18.3
91	.	1845-46 to 1849-50	23.4
85	. . . . .	1850-51 to 1854-55	21.9
127	.	1855-56 to 1859-60	32.6
165		1860-61 to 1864-65	42.4
202	.	1865-66 to 1869-70	51.9
139		1870-71 to 1874-75	35.7
209		1875-76 to 1879-80	53.7
145	.	1880-81 to 1884-85	37.3
150		1885-86 to 1889-90	38.6
188	.	1890-91 to 1894-95	48.3
200		1895-96 to 1899-1900	51.4
198	.	1900-01 to 1904-05	50.9
266		1905-06 to 1909-10	68.4
280	. . . . .	1910-11 to 1914-15	72.0
361		1915-16 to 1919-20	92.8
423	. . . . .	1920-21 to 1924-25	108.7
389	. . . . .	1925-26 to 1929-30	100.0
221		1930-31 to 1934-35	56.8
223		1935-36 to 1939-40	57.3
436	.	1940-41 to 1944-45	112.0
817	. . . . .	1945-46 to 1949-50	210.0
1054	. . . . .	1950-51 to 1951-52	292.0
		(6 months of 1952-53)	

(iv) (a)—Wholesale Prices of Rice, Wheat and Jowar at

GOALPARA			PATNA			BOMBAY			NAGPUR		
Year	Rice (Common)	Rice [Balai No 1(a)]	Wheat [Deshi Magahi (a)]	Rice [Hunked (b) Rangam]	Wheat [Delhi No 1 white penny]	Jowar (Sholapur (b))	Bajra [Ghani (b)]	Rice (Coarse Gurmata)	Wheat (Medium)	Jowar (Bold)	
1	2	3	4	5	6	7	8	9	10	11	
	Rs As Ps	Rs As Ps	Rs As Ps	Rs As Ps	Rs As Ps	Rs As Ps	Rs As Ps	Rs As Ps	Rs As Ps	Rs As Ps	
1939	3 8 2	4 0 5	3 9 4	3 4 11	5 1 10	3 1 5	3 9 2	3 5 0	3 5 0	2 8 0	
1940	4 1 10	4 13 2	3 13 5	4 6 7	3 15 2	3 7 5	3 13 6	4 5 9	3 13 0	2 7 7	
1941	4 2 2	5 15 0	4 5 2	5 15 1	4 11 7	3 4 4	5 3 9	4 9 5	3 12 2	2 6 5	
1942	4 2 4	7 11 7	6 4 0	7 4 10	6 5 11	4 6 5	5 15 6	6 14 8	6 2 1	4 10 2	
1943		14 9 2	15 2 0				..	8 8 6	7 10 8	7 7 8	
1944		13 12 0 (medium)	15 2 8		11 8 0		6 13 0			..	
1945	11 11 0	11 11 10 (medium)	11 0 0	18 12 0	11 8 0	6 0 6	6 13 0	9 8 0 ^a	9 10 2 ^a	6 5 0 ^a	
1946	12 1 4	13 1 4 (medium)	12 1 5	16 6 0	15 1 0	6 0 6	6 13 0	9 7 10 ^a	10 2 6 ^a	6 12 2 ^a	
1947	13 11 5	13 0 0 (medium)	12 5 0		13 1 0	6 0 6	6 13 0	10 6 4 ^a	13 7 0 ^a (inferior)	6 15 3 ^a	
1948	16 4 0	16 0 0 (medium)	12 0 0	18 12 0	13 1 0	7 7 5	8 5 11	14 14 8	18 0 8 ^a (inferior)	10 15 4	
1949	18 15 3	19 8 0 (paddy)	21 10 0	21 14 0	13 1 0	7 10 2	8 5 5	15 2 4	24 4 8	14 11 8	
1950	19 3 4	26 10 8	25 8 0	17 12 0	12 8 8	8 0 0	8 0 0	16 10 4	20 10 4	16 7 6	
1951	28 0 0	29 10 8	18 9 7	18 12 0	15 12 0 16 0 8	9 3 8 10 0 8 (MUN)	N.A.	23 12 4	24 14 9	17 13 10 ^(d)	

Selected Centres in Different Parts of the Country

[Prices in rupees per standard maund]

	KAKINADA			COIMBATORE			CUTTACK			AMRITSAR		KANPUR		HAPUR		CALCUTTA
Years	Rice (Sort II) Purnasa			Jowar	Bajra		Rice (Dhanki Moti)			Rice (Husked)	Wheat	Rice (Common)	Wheat (Medium Dars)	Wheat (Devi-10/1 Dars)	Rice (Ballan No 1 Shipment quality)	
1	12	13	14	15	16	17	18	19	20	21						
	Rs. As Ps.	Rs. As Ps.	Rs. As Ps.	Rs. As Ps.	Rs. As Ps.	Rs. As Ps.	Rs. As Ps.	Rs. As Ps.	Rs. As Ps.	Rs. As Ps.	Rs. As Ps.	Rs. As Ps.	Rs. As Ps.	Rs. As Ps.	Rs. As Ps.	Rs. As Ps.
1939	...	...	...	1 12 1	3 6 10	2 10 11	4 13 2	3 7 4	2 15 6	4 10 6						
1940	4 9 7	2 9 9	2 15 0	3 11 10	4 1 0	3 4 10	4 6 6	3 12 8	3 3 3	4 13 11						
1941	4 12 4	2 9 3	2 14 8	4 6 1	5 15 9	3 12 4	5 15 8	4 6 1	3 11 9	6 4 0						
1942	5 9 9	3 13 2	4 3 0	5 2 7	7 12 5	5 1 0	9 7 7	6 14 7	5 1 5	8 4 2						
1943	8 4 9	10 11 5	11 5 2	11 6 11	14 5 7	10 14 8	16 15 9	12 7 6	11 9 1	19 0 0						
1944	7 14 1	11 1 2	...	9 0 0	12 5 0	9 1 4	13 8 9	12 15 4		15 0 0						
1945	8 3 2	...	7 4 7	7 12 0 (common)	12 11 4	9 4 8	17 11 8	12 10 4	10 8 0	14 9 4						
1946	7 15 4	7 1 2	7 6 7	7 1 0 (common)	13 15 3	10 0 7	15 0 0	11 4 0	10 4 0	13 13 8						
1947	9 0 10	7 0 2	7 10 6	7 12 0 (common)	15 6 6	9 15 6	15 0 0	11 4 0	10 4 0	15 0 0						
1948	13 13 0	8 15 8	12 4 0	11 6 0 (common)	15 8 6 (medium)	12 5 0	24 13 5 (sale III)	13 1 0	21 11 8	16 5 4						
1949	13 2 8	7 13 3	7 15 3	11 6 0 (common)	19 11 3	14 8 0	24 9 0 (sale III)	15 3 2	15 3 2	17 8 0 (other than fine variety Retail)						
1950	12 4 9	10 12 7	9 13 11	13 7 2	19 3 7	12 30 0	22 1 1 (sale III)	15 4 7	15 4 7	16 2 0						
1951	23 3 0	11 7 3	9 12 11	15 6 7	17 15 3	13 4 3	14 15 0 (sale III)	15 5 9	15 5 9	16 14 0 (grade B)						
1952	...	...	...	...	...	...	...	...	...	17 8 0						

INDEX† NUMBER OF WHOLESALE PRICES

<i>Year</i>	<i>Rice</i>	<i>Wheat</i>	<i>Jowar</i>
1	2	3	4
1939	115	132	101
1940	123	137	88
1941	159	167	91
1942	191	216	92
1943	589	339	189
1944	349	378	162
1945	330	372	167
1946	321	359	166
1947	334	375	185
1948	468	691	201
1949	494	635	274
1950	525	531	340
1951	544	549	297
1952	527	533	216

†1939 to 46 (Base Week ended 19th August, 1939=100)

1947 to 1952 (Base . Year ended August, 1939=100)

(iv) (b)—Index Numbers of Prices of Wheat in the United States, 1866 to 1951

<i>Wheat (U. S. A)</i>		
<i>Year</i>	<i>Prices</i>	<i>Index No of Prices (With 1926-30 as base)</i>
1	2	3
1866-75	124 6	122 3
1876-85	92 3	90 6
1886-95	67 7	66 4
1896-1900	65 7	64 5
1901-05	71 6	70 3
1906-10	87 3	85 7
1911-15	89 0	87 3
1916-20	193 0	189 4
1921-25	111 2	109 1

(iv) (b)—Index Numbers of Prices of Wheat in the United States, 1866 to 1951—*contd.*

Year	Wheat (U S A)	
	Prices	Index No of Prices (With 1926-30 as base)
1	2	3
1926-30	101.9	100.0
1931-35	60.0	58.9
1933	74.4	73.0
1934	84.8	83.2
1935	83.1	81.5
1936	102.5	100.6
1937	96.2	94.4
1938	56.2	55.2
1939	69.1	67.8
1940	68.2	66.9
1941	94.4	92.6
1942	110.0	107.9
1943	136.0	133.5
1944	141.0	138.4
1945	150.0	147.2
1946	191.0	187.4
1947	229.0	224.7
1948	199.0	195.3
1949	188.0	184.5
1950	200.0	196.3
1951 (prel)	212.0	208.0

(v) Export and import trade and balance of trade.

The two tables given on pages 318-319 were prepared by the Statistical Officer of the office of the Chief Controller of Imports and Exports, based on official figures of export and import trade. Both the tables relate to the following periods :

- (i) India with all countries including Pakistan during 1951-52.
- (ii) India with all countries including Pakistan—Average of the years 1948-49 to 1950-51.
- (iii) India *cum*-Pakistan with all countries—Average of the years 1948-49 to 1950-51
- (iv) Un-divided India with all countries—Average of the years 1938-39 to 1940-41.

2 Table (a) gives the Export Trade, Import Trade and balance of Trade in lakhs of Rupees. Table (b) gives them in terms of Thousands of Grain tons. The conversion factor applied for the various periods, which is based on the net import/export of wheat and rice (exclusive of paddy), is as follows :

Period 1951-52.	Rs 495/1 per ton
Period 1948-49 to 1950-51	Rs. 418/7 per ton
Period 1938-39 to 1940-41	Rs 86/8 per ton

3 The two tables give Commodity Categories and Classes. Annexure I to the tables gives the list of commodities which have been classified. Annexure II gives the classification of the commodities given in Annexure I into Categories and Classes.

Table (a)—Export and Import

Foreign Trade Commodity Categories and Classes	India's trade with all countries including Pakistan			India's trade with all countries including Pakistan		
	1951-52			Average of the years 1948-49 to 1950-51		
	Exports	Imports	Net Exports (+) Net Imports (-)	Exports	Imports	Net Exports (+) Net Imports (-)
1	2	3	4	5	6	7
Category A						
I Grain, Pulses and Flour	.	23,030	-23,030	24	10,070	-10,046
II Other Foodstuffs, Narcotics, and Bever- ages	19,772	4,386	+15,386	14,177	3,779	+10,398
III Seeds, Manures and Fodders, and other goods of vegetable or animal origin other- wise unclassified	1,703	969	+734	1,702	1,431	+271
IV Textiles, and made- up textile goods	39,369	28,007	+11,362	28,514	15,670	+12,844
V Leather, Leather pro- ducts and Rubber	3,732	545	+3,187	3,014	451	+2,563
VI Wood, woody materi- als and their products	175	818	-643	114	630	-516
Total A	64,751	57,755	+6,996	47,545	32,031	+15,514
Category B						
I Machinery and Mill work	122	10,296	-10,174	74	9,125	-9,051
II Vehicles	118	3,321	-3,203	73	2,724	-2,651
III Construction and Engineering Stores	258	160	+98	94	333	-239
IV Metals and Metal Products otherwise unclassified	2,441	7,266	-4,825	1,135	6,640	-5,505
V Chemicals and Che- mical Products	2,471	5,916	-3,445	1,536	3,792	-2,256
VI Non-metallic Materi- als and their pro- ducts otherwise un- classified	2,345	8,404	-6,059	1,399	5,211	-3,812
Total B	7,755	35,363	-27,608	4,311	27,825	-23,514

Trade in lakhs of Rupees

<i>Trade of India-cum-Pakistan</i>			<i>Trade of Undivided India</i>		
<i>Average of the years 1948-49 to 1950-51</i>			<i>Average of the years 1938-39 to 1940-41</i>		
<i>Exports</i>	<i>Imports</i>	<i>Net Exports (+) Net Imports (-)</i>	<i>Exports</i>	<i>Imports</i>	<i>Net Exports (+) Net Imports (-)</i>
8	9	10	11	12	13
4	9,816	-9,812	632	1,664	-1,032
12,818	3,373	+9,445	3,620	1,321	+2,299
1,686	1,040	+646	1,558	289	+1,269
36,114	13,841	+22,273	10,019	3,330	+6,689
3,274	343	+2,931	1,549	595	+1,054
78	615	-537	31	447	-416
53,974	29,028	+24,946	17,409	7,556	+9,853
48	9,927	-9,879	28	1,555	-1,527
70	3,295	-3,225	58	679	-621
84	252	-168	39	62	-23
1,023	7,439	-6,416	757	1,972	-1,215
1,350	4,378	-3,028	357	1,231	-874
1,109	5,721	-4,612	334	2,037	-1,703
3,684	31,012	-27,328	2,583	7,596	-5,013

Table (a)—Export and Import

Foreign Trade Commodity Categories and Classes	India's trade with all countries including Pakistan			India's trade with all countries including Pakistan		
	1951-52			Average of the years 1948-49 to 1950-51		
	Exports	Imports	Net Exports (+) Net Imports (-)	Exports	Imports	Net Exports (+) Net Imports (-)
1	2	3	4	5	6	7
Category C						
I, Paper and paper products, printing material, books and publications, and works of art.	381	1,937	-1,556	160	1,540	-1,380
II Consumer goods otherwise unclassified	564	1,023	-459	362	842	-480
Total C	<u>945</u>	<u>2,960</u>	<u>-2,015</u>	<u>522</u>	<u>2,382</u>	<u>-1,860</u>
Category D						
Insufficiently described articles of Merchandise	783	527	+256	674	437	+237
Category E						
Treasure	163	4,425	-4,262	113	1,149	-2,036
Grand Total	<u>74,397</u>	<u>101,030</u>	<u>-26,633</u>	<u>53,165</u>	<u>63,824</u>	<u>-10,659</u>

Notes —(1) Exports include re-exports

(2) Above figures are for land, sea and air borne trade.

(3) As detailed statistics of Pakistan trade with countries other than India is not available, category D of India-*cum*-Pakistan trade is some what exaggerated and include all such items for which separate figures are not available

(4) As Pakistan's land trade with Countries other than India though negligible is not available, it is not included in figures for trade of India-*cum*-Pakistan

Trade in Lakhs of Rupees—*contd*

<i>Trade of India-cum-Pakistan</i>			<i>Trade of un-divided India</i>		
<i>Average of the years 1948-49 to 1950-51</i>			<i>Average of the years 1938-39 to 1940-41</i>		
<i>Exports</i>	<i>Imports</i>	<i>Net Exports (+) Net Imports (—)</i>	<i>Exports</i>	<i>Imports</i>	<i>Net Exports (+) Net Imports (—)</i>
8	9	10	11	12	13
144	1,711	—1,567	55	524	—469
335	862	—527	307	505	—198
<u>479</u>	<u>2,573</u>	<u>—2,094</u>	<u>362</u>	<u>1,029</u>	<u>—667</u>
1,146	2,934	—1,788	104	52	+52
<u>113</u>	<u>1,149</u>	<u>—1,036</u>	<u>2,166</u>	<u>374</u>	<u>+1,792</u>
<u>59,396</u>	<u>66,696</u>	<u>—7,300</u>	<u>21,624</u>	<u>16,607</u>	<u>+5,017</u>

TABLE (b)—Exports and Imports Trade

Foreign Trade Commodity Categories and Classes	India's trade with all countries including Pakistan			India's trade with all countries including Pakistan		
	1951-52			Average of the year 1948-49 to 1950-51		
	Exports	Imports	Net Exports (+) Net Imports (—)	Exports	Imports	Net Exports (+) Net Imports (—)
1	2	3	4	5	6	7
Category A						
I Grain, Pulses and Flour		4,652	—4,652	6	2,405	—2,399
II Other Foodstuffs, Narcotics, and Be- verages	3,994	886	+3,108	3,386	903	+2,483
III Seeds, Manures and Fodders, and other goods of vegetable or animal origin other- wise unclassified	344	196	+148	406	341	+65
IV Textiles, and made- up textile goods	7,951	5,656	+2,295	6,810	3,743	+3,067
V Leather, Leather pro- ducts and Rubber	754	110	+644	720	108	+612
VI Wood, woody ma- terials and their pro- ducts	35	165	—130	27	150	—123
Total A	13,078	11,665	+1,413	11,355	7,650	+3,705
Category B						
I Machinery and Mill work	25	2,080	—2,055	18	2,180	—2,162
II Vehicles	24	671	—647	18	651	—633
III Construction and Engineering Stores	52	32	+20	22	80	—58
IV Metals and Metal Products otherwise unclassified	493	1,468	—975	271	1,586	—1,315
V Chemicals and Chemical Products	499	1,195	—696	367	906	—539
VI Non-metallic Min- erals and their pro- ducts otherwise un- classified	474	1,697	—1,223	334	1,245	—911
Total B	1,567	7,143	—5,576	1,032	6,646	—5,616

Notes:—(1) Prices taken into account in calculation of grain tons are based on net export/imports of wheat and rice (incl. paddy) during the relevant periods i.e. (i) for the period 1951-52 Rs 495 1 per ton (ii) for the period 1948-49 to 1950-51 Rs 418 7 per ton and (iii) for the period 1938-39 to 1940-41 Rs 86 8 per ton.

(2) Exports include re-exports

(3) Above figures are for land, sea and air-borne trade.

in Thousands of Grain Tons

<i>Trade of India cum-Pakistan</i>			<i>Trade of un-divided India</i>		
<i>Average of the year 1948-49 to 1950-51</i>			<i>Average of the year 1938-39 to 1940-41</i>		
<i>Exports</i>	<i>Imports</i>	<i>Net Exports (+) Net Imports (-)</i>	<i>Exports</i>	<i>Imports</i>	<i>Net Exports (+) Net Imports (-)</i>
8	9	10	11	12	13
1	2,344	-2,343	728	1,917	-1,189
3,061	806	+2,255	4,171	1,522	+2,649
403	248	+155	1,795	333	+1,462
8,625	3,306	+5,319	11,542	3,836	+7,706
782	82	+700	1,784	582	+1,202
19	146	-127	36	515	-479
12,891	6,932	+5,959	20,056	8,705	+11,351
12	2,371	-2,359	32	1,791	-1,759
17	787	-770	67	782	-715
20	60	-40	45	71	-26
244	1,777	-1,533	872	2,272	-1,400
322	1,046	-724	423	1,456	-1,033
265	1,366	-1,101	385	2,347	-1,962
880	7,407	-6,527	1,824	8,751	-6,927

(4) As detailed statistics of Pakistan trade with countries other than India are not available, the India-cum-Pakistan trade is somewhat exaggerated and exclude all such items for which separate figures are available.

(5) As Pakistan's land trade with countries other than India is not available, the India-cum-Pakistan trade is somewhat exaggerated and include all such items for which separate figures are available.

TABLE (b)—Exports and Imports Trade

Foreign Trade Commodity Categories and Classes	India's trade with all countries including Pakistan		India's trade with all countries including Pakistan			
	1951-52		Average of the year 1948-49 to 1950-51			
	Exports	Imports	Net Exports (+) Net Imports (-)	Exports	Imports	Net Exports (+) Net Imports (-)
1	2	3	4	5	6	7
Category C						
I Paper and paper products, printing material, books and publications and works of art	77	391	-314	38	353	-315
II Consumer goods otherwise unclassified	114	207	-93	86	201	-115
Total C	191	598	-407	124	554	-430
Category D						
Insufficiently described articles of merchandise	158	106	+52	161	104	+57
Category E						
Treasure	33	894	-861	27	274	-247
Grand Total	15,027	20,406	-5,379	12,697	15,243	-2,546

in Thousands of Grain Tons—concl'd.

<i>Trade of India-cum-Pakistan</i>			<i>Trade of un-divided India</i>		
<i>Average of the year 1948-49 to 1950-51</i>			<i>Average of the year 1938-39 to 1940-41</i>		
<i>Exports</i>	<i>Imports</i>	<i>Net Exports (+) Net Imports (—)</i>	<i>Exports</i>	<i>Imports</i>	<i>Net Exports (+) Net Imports (—)</i>
8	9	10	11	12	13
34	409	—375	63	603	—540
80	206	—126	354	582	—228
<u>114</u>	<u>615</u>	<u>—501</u>	<u>417</u>	<u>1,185</u>	<u>—768</u>
274	701	—427	120	60	—60
27	274	—247	2,495	431	+2,064
<u>14,186</u>	<u>15,929</u>	<u>—1,743</u>	<u>24,912</u>	<u>19,132</u>	<u>+5,780</u>

ANNEXURE I

List of Commodities

- | | | |
|---|--|---|
| 1. Animals, living | 41 Grain, Pulse and Flour | 81 Salt |
| 2 Apparel | 42 Graphite crucibles | 82 Seeds |
| 3 Arms, Ammunition and Military Stores | 43 Gums and Resins | 83 Shells and Corals |
| 4 Art. Works of | 44 Hair | 84 Smoker's requisites |
| 5 Asbestos | 45 Hardware | 85 Soap |
| 6 Baskets and Basketware | 46 Hides and Skins, raw | 86 Specimens illustrative of natural science |
| 7 Belting for machinery | 47 Hops | 87 Spices |
| 8 Bootbush | 48 Horns, tips and pieces of horn | 88 Starch Dextrine and Farina |
| 9 Boots, printed and printed matter | 49 Instruments, Appliances and parts thereof | 89 Stationery |
| 10 Boots and Shoes | 50 Ivory | 90 Sticks and whips |
| 11 Brushes and fibre for brushes and brooms | 51 Jewellery | 91 Stone and Marble |
| 12 Brushes and Brooms | 52 Lac | 92 Sugar |
| 13 Building and Engineering materials | 53 Leather | 93 Tallows and Stearine |
| 14 Buttons | 54 Liquors | 94 Tea |
| 15 Candles of all kinds | 55 Machinery and Millwork | 95 Tea-crests entire or in sections and parts thereof |
| 16 Canes and Rattans | 56 Mannes | 96 Telegraph's materials for construction and accessories |
| 17 Chalk, French | 57 Matches | 97 Telephones materials for construction and accessories |
| 18 Chemicals and chemical preparations | 58 Match making materials | 98 Textiles |
| 19 China clay | 59 Mats and matings | 99 Tobacco |
| 20 Chinese and Japanese ware | 60 Metals and Ores | 100 Toilet requisites |
| 21 Clocks and Watches and parts thereof | 61 Mica | 101 Toys and requisites for games and sports |
| 22 Coal and Coke | 62 Oils | 102 Umbrellas and umbrella fittings |
| 23 Coffee | 63 Oil Cakes | 103 Vehicles |
| 24 Cuir | 64 Oil-cloth and Floor-cloth | 104 Wax of all kinds |
| 25 Coral | 65 Opium | 105 Wood and timber |
| 26 Cordage and Rope of vegetable fibre | 66 Packing, engine and boiler | 106 Postal articles not specified |
| 27 Cork Manufacture | 67 Paints and Painters' materials | 107 Articles imported as baggage |
| 28 Cutlery | 68 Paper and Paste board | 108 All other articles of merchandise |
| 29 Drugs and Medicines | 69 Paper making materials | 109 Bones for manufacturing purposes |
| 30 Dyeing and Tanning Substances | 70 Paraffin wax | 110 Casein |
| 31 Earthenware and Porcelain | 71 Perfumery | 111 Feathers |
| 32 Electroplated ware | 72 Pitch and Tar | 112 Fibre for brushes and brooms |
| 33 Fireworks | 73 Plants, living including Bulbs and Seeds for sowing | 113 Jade-stone |
| 34 Fish | 74 Plastic materials and Manufactures | 114 Kapok |
| 35 Fodder, Bran and Pollards | 75 Polishes | 115 Lacquer ware |
| 36 Fruits and vegetables | 76 Precious stones and Pearls, unset | 116 Monazite |
| 37 Furniture and Cabinetwork | 77 Printing and Lithographing machinery and material | 117 Tea Waste |
| 38 Gelatine | 78 Fruits, Engravings and Pictures | |
| 39 Glass and Glassware | 79 Provisions and Oilman's stores | |
| 40 Ghee | 80 Rubber | |

ANNEXURE II

Foreign Trade—Commodity Categories and Classes

Categories	Classes
A	I Grain, Pulses and Flour 41
	II Other Foodstuffs, Narcotics and Beverages 23, 34, 36, 54, 62 (Vegetable oils), 65, 79, 81, 87, 88, 92, 94, 99, 110, 117
	III. Seeds, Manures and Fodders and other goods of vegetable or animal origin otherwise unclassified 1, 35, 38, 40, 47, 56, 63, 70, 73, 82, 93, 104, 109, 111
	IV Textiles, and made-up Textile Goods 11, 12, 24, 26, 44, 64, 98, 112, 114
	V Leather, Leather Products and Rubber 10, 27, 46, 53, 80
	VI Wood, woody materials and their products 6, 8, 16, 37, 58, 95, 105
B	I Machinery and Millwork 7, 55, 66
	II Vehicles 103
	III Construction and Engineering Stores 13, 96, 97
	IV Metals and Metal products otherwise unclassified 3, 28, 42, 45, 49, 60
	V Chemicals and chemical products 15, 17, 18, 29, 30, 33, 43, 52, 57, 67, 72, 74, 75, 115
	VI Non-metallic Minerals and products otherwise unclassified 5, 19, 22, 31, 39, 61, 62 (other than vegetable oils), 91, 116
C	I Paper and paper products, printing material, books and publications and works of art 4, 9, 68, 69, 77, 78, 86, 89
	II Consumer Goods otherwise unclassified 2, 14, 20, 21, 25, 32, 48, 50, 51, 71, 76, 83, 84, 85, 90, 100, 101, 102, 106, 107, 113
D	Insufficiently described articles of merchandise 108
E	Treasure

(vi) Extracts from Reports of the Economic Commission for Asia & the Far East (1951 & 1952)

RICE

Before the war, the region as a whole was more than self-sufficient in foodgrains, having a net export of over one million tons per year. Within this total picture, however, there were important deficit areas, notably (1) China, India and Japan countries of large population and having a greater degree of industrialization, (2) Ceylon, Indonesia, Malaya and the Philippines, the mainly raw material export economies, and (3) Hong Kong and Singapore, the entrepôts of the region. The deficiencies of these areas were in the pre-war years, largely made up by large imports from within the region. The pre-war surplus areas were (1) Burma, Indochina and Thailand, the major rice exporters and (2) Korea and Taiwan, rice exporters under Japanese control. The pre-war intra-regional trade of grains was thus predominantly in rice.

While the aggregate pre-war rice production of the surplus areas was only 18 per cent. of the regional total, these areas were responsible for more than 95 per cent. of the region's exports of rice. On the other hand, China, India and Japan, while producing some three-quarters of the region's rice, accounted for about 70 per cent. of the region's total imports and absorbed one-half of the total export of rice from the rest of the region.

After the war, there was some change in the deficit and surplus areas. The restitution of Taiwan and the North-East (Manchuria) made China at least potentially self-sufficient, while the partition left Pakistan with self-sufficiency or a small surplus in food production. On the other hand, India inherited most of the deficit areas of the sub-continent and Japan was deprived of all its colonial sources of supply. In 1951, the food deficits ranged from 5 per cent. of total supply in Indonesia, 10-12 per cent. in India and the Philippines, 21 per cent. in Japan, and 58 per cent. in the Federation of Malaya, to 75 per cent. in Ceylon. At the same time, the export availabilities within the region had greatly decreased, exports from the rice surplus areas of Burma, Thailand and the three states of Indochina being only half the pre-war volume. In Korea, the pre-war surplus was replaced by a

deficit. The decline in the region's exportable surplus was due both to decreased production and to increased consumption caused by population increases. On the mainland of China, however, there emerged an appreciable export availability.

(ECAFE Report, Page 14)

Before the war, the region accounted for some 93 per cent. of the world production of rice. Its proportion of world consumption was somewhat less, owing to exports to countries outside the region. Rice accounted for about 50 per cent. of the region's total grain production in terms of tonnage and constituted the staple food of about two-thirds of the population. Since the end of the Second World War, there has been a persistent shortage of rice, and the region has depended upon imports from other parts of the world to supplement its own production. At the same time, its share in world production of rice has become somewhat smaller, owing to a significant increase in production on the American continent and in other areas.

Production—In 1950/51 the world area under rice reached the record total of 94 million hectares but world production, estimated at 153 million tons in terms of paddy, showed a relatively small gain, while in Asia and the Far East there was a slight decrease. In 1951/52, the rice production of the world as a whole, as well as of the region, showed an increase over 1950/51.

Outside the region, rice production in 1951/52 recorded a substantial increase over the previous year in Europe and in the United States. These increases more than offset the short crops harvested in Egypt and Latin America. It may be noted, however, that rice production outside Asia and the Far East amounts to only 7 per cent. of the world total.

Trade—World exports of rice, which totalled 4.3 million tons (cleaned basis) in 1950, are expected to show an increase in 1951. Estimates of exportable surpluses and available statistics of shipments from the major exporting areas suggest that the total quantity of rice entering international trade may have reached its post-war peak thus far in 1951 at a level of just over one-half of the pre-war average. The supplies exported during the year from the "rice bowl"

countries in South-East Asia—Burma, Thailand, Vietnam and Cambodia—are expected to be larger than in 1950 and may account for nearly three-fourths of the total world exports. Exports from Burma almost equalled those of Thailand and the combined shipments from these two major sources reached a post-war peak of almost 3 million tons. In recent years Cambodia and Vietnam exported only 10-20 per cent of the pre-war average of 1.3 million tons.

(ECAFÉ Report 1951, page 23)

TABLE 6
RICE PRODUCTION
(In Thousand Tons of Paddy)

	Pre-war (average)	1948-1950 (average)
British Borneo	170	170**
Burma	6,971	5,219
Cambodia, Laos and Vietnam	6,498	4,583
Ceylon	340	306
China :		
Mainland	50,476	47,065
Taiwan	1,642	1,795**
India	34,182	33,608
Indonesia :		
Java and Madura	6,081	5,738†
Outer islands		3,839†
Japan	11,501	11,976
Korea (south)	2,726	3,061
Malaya	513	637
Pakistan	11,169	12,580
Philippines	2,179	2,620
Thailand	4,357	6,767
REGIONAL TOTAL*	143,800	139,733

(ECAFÉ Report 1951, page 24)

TABLE 7
INTERNATIONAL TRADE IN RICE
(In Thousand Tons)

Exports from	1954-38 (average)	1948-50 (average)
Burma	3,064	1,209
Indo-China	1,317	139
Korea	1,158	8
Pakistan	393	35
Taiwan (China)	674	164
Thailand	1,388	1,170
Others	55	16
TOTAL	8,049	2,741

*Including others

** Average for 1949 & 1950 only

† Average for 1948 & 1949 only

Imports into	1934-38 (average)	1948-50 (average)
British Borneo	52	28
Ceylon	530	439
China	687	353
Hong Kong	176	121
India	1,883	708
Indonesia	261	232
Japan	1,732	280
Malaya	541	468
Philippines	35	79
Others	44	128
TOTAL	5,941	2,836

(ECAFÉ Report 1951, page 25)

TABLE 8
WHEAT AND COARSE GRAIN PRODUCTION
(In Million Tons)

	1934-38 (average)	1948-50 (average)
Wheat	34.8	34.8
Barley	12.7	12.4
Oats	1.2	1.0
Maze	14.6	15.1
TOTAL	63.3	63.2
Millets and Sorghums	36.5	33.2

(ECAFÉ Report 1951, page 26)

The lower post-war level of production in face of increased food requirements created a serious regional shortage. This deficiency was partially met by the change in the region's trade position from a net food-grain exporter of 1.5 million tons per annum in pre-war years to a net importer of 6.7 million tons per annum in recent years. Thanks to a gradually rising level of foodgrains imports, the total grain supply surpassed the pre-war level of some 199 million tons, in 1948/49, 1950/51 and 1951/52

(ECAFÉ Report 1951, Page 9)

TABLE 3
AVAILABLE SUPPLIES OF FOODGRAINS

(Million Tons)

	1944/48	1948/49	1949/50	1950/51	1951/52
Rice					
Regional production—	100.6	99.6	98.2	97.5	98.3
Net import (+) or export (—)	* -2.1	+0.06	+0.3	-0.1	
Available supply	98.5	99.7	98.5	97.4	98.3
Wheat					
Regional production	34.8	35.2	32.6	36.6	38.1
Net import	1.0	4.7	4.6	4.4	6.0
Available Supply	35.8	39.9	37.2	41.0	44.1
Coarse grains					
Regional production	65.0	62.7	61.0	61.3	69.5
Net import (+) or export (—)	-0.4	0.9	0.8	1.5	1.2
Available Supply	64.6	63.6	61.8	62.8	64.7
TOTAL GRAIN SUPPLY	198.9	203.2	197.5	201.2	207.1

* The trade in rice is for calendar year for the second half of the crop season shown, i.e., 1949 trade under 1948-49 crop season, etc.

The deficiency in grain supply was not evenly spread out in all parts of the region but was concentrated in India and some other deficit areas. In 1950/51, all countries for which data are available, except Japan and the Philippines, had a per capita consumption level which, in terms of calories, was lower than pre-war. There was, however, a general improvement in the year, as compared with 1949-50, except in India which suffered a serious decline, as shown in Table 4.

(ECAF Report 1951, page 10)

TABLE 1-1
INDIA: NUMBERS OF VOLUME OF TOTAL AND PER
CAPITA CROP PRODUCTION (a)
(1934-38=100)

FOODSTUFF	1949/50	1950/51	1951/52
All crops	95	99	101
Food crops (a)	96	99	101
Non-food crops (a)	86	99	104
Per capita	112	112	113
Per capita, all crops	85	88	89
Per capita, food crops	86	88	90
ICMFI region excluding Ceylon			
All crops	103	104	104
Food crops (a)	105	103	103
Non-food crops (a)	91	107	110
Per capita	118	119	120
Per capita, all crops	87	87	87
Per capita, food crops	89	87	86

(ECAF Report 1952, page 1)

Ceylon

In 1951, three-quarters of Ceylon's food requirements had to be imported, at the same time, rubber, tea and coconuts accounted for 91 per cent of its export and 66 per cent of its total crop area. In 1950 and 1951, the value of food imports amounted to some 50 per cent of the total value of imports. Thanks to efforts towards self-sufficiency in accordance with the Six-Year Plan, rice production increased substantially in 1950/51, but was accompanied by a sizeable increase in imports. Nevertheless, both the production and total supply of rice remained below the pre-war level. This deficiency in rice supplies was more than made up by the increased use of imported wheat and flour, with a total grain and wheat flour supply some 12 per cent above the pre-war level. In 1951/52 not only the production but also the import of rice declined to the 1949/50 level, consequently, the grain supply was lower than in 1950-51 in spite of a further increase in wheat imports.

(ECAF Report 1951, Pages 14-15)

India:

Both the long and short-term aspects of India's food problem have become increasingly urgent in the last few years. Before the war, the Indo-Pakistan sub-continent had an annual

foodgrains import of some 1.6 million tons, this being mostly rice from Burma. Since partition, India has inherited the pre-war deficit status in addition to the loss of some 0.8 million tons per year from former surplus areas which now are part of Pakistan.

India's foodgrain production has lagged behind population at an increasing rate. Between 1941 and 1951, while the population increased by some 13.4 per cent, grain production varied from 10 per cent, below to 7 per cent, above the 1938/39 level. In addition, there has been a persistent deterioration in yield per acre under rice since pre-war. Even in normal year, Indian production falls short of requirements by some 3 million tons at the 1950 ration standards. This is the long-term aspect of the country's food situation.

In the short term, the country suffered crop failures in 1950 and 1951 due to droughts, floods, insect pests and other adverse natural factors. In 1950/51, grain production declined by some 10 per cent. from the previous year's level which had been about the same as pre-war. For 1951/52, serious crop failures are again reported as a result of the succession of droughts, although total grain output may be slightly higher than in 1950/51. The curtailed production of cereals was only partly offset by large imports. In 1950/51 and 1951/52, total cereal supply fell short of that in 1948/49 by more than one million tons, while population increased by several million.

There has thus been a serious decline in the per capita supply and nutritional standard, from 310 lbs. per annum in pre-war years to 266 lbs. in 1949/50, 255 lbs. in 1950/51 and probably even lower in 1951/52. This was reflected in the basic daily ration, which was 12 ozs. per capita in 1951 and, for a short period, only 9 ozs., comparing very unfavourably with the target set by the Five-Year Plan, which upon realization would restore consumption to the pre-war level for the Indo-Pakistan sub-continent of some 16 ozs. per day for each adult.

Another short-term aspect of the food problem is the considerable variation in production between different areas which, together with transport shortages, has resulted in localized famines.

Government measures dealing with the food situation include rationing in selected areas, subsidies on imported foodgrains, the securing of large supplies from abroad, price control and various measures to promote an expansion of production.

One dilemma facing the country is that, while its greatest need is for rice, it has to purchase mainly wheat and coarse grains by reason of the limited export availability of rice overseas. India, like many other countries, has also been faced with the problem of relative prices favouring the cultivation of commercial and industrial crops in preference to food. The price situation began to change in the second half of 1951, but at the same time the negative balance of payments re-appeared and created a new set of difficulties for increasing food supply.

(ECAFE Report 1951, page 15-16)

Japan :

In contrast to the countries specializing in export agriculture, Japan is an industrialized country, which is also highly dependant upon imports for food supplies. In pre-war years, Japan's economy was integrated with the then colonial areas, notably Korea and Taiwan, which shipped a combined volume of 1.6 million tons of rice per year to the home islands. This was just sufficient to meet Japan's import requirements.

The situation changed radically after the war. The dissolution of its empire deprived Japan of its supplementary supplies, and the country had to look for other sources of food imports in addition to increasing its home production. In 1948, the rice harvest rose to a level 3 per cent. higher than the average of 1933-35 as a result of increased supplies of fertilizers and other agricultural requisites as well as favourable weather conditions. The planted area and production continued to increase, and in 1950, the rice harvest was 7 per cent. higher than pre-war. Meanwhile, wheat and other grains witnessed an even larger increase in yields, being, in 1950, 15 per cent. above pre-war. In 1951 as compared with the previous year, however, the rice crop sustained a decline of some 500,000

loss due to the unusually cool weather and typhoon, but the decline was largely offset by the consistent increase in the production of wheat and other grains resulting in a total indigenous cereal supply similar to that of the previous year.

In 1951, therefore, the maintained grain production, the increase in grain imports from 2.4 to 2.8 million tons, and the drawing of some half-million tons from the normal stock effected an increase of nearly one million tons in the availability for consumption as compared with the previous year.

The nutritional level, in terms of *per capita* consumption of calories, protein and fat, improved between 1946 and 1950, and further in 1951 although it was still below pre-war.

(ECAF Report 1951, pages 17-18)

Burma:

Burma is highly dependent on rice for both employment and foreign exchange resources. Before the war, rice accounted for 70 per cent of its cultivated acreage and some 50 per cent of its exports. It was, at that time, the world's leading exporter of rice, with an annual volume of export equalling that of the next two largest exporters, Thailand and Indo-China, combined

average of 1.7 million tons. As the population increased at a rate of only 0.6 per cent per year during 1941-51, the *per capita* retained supply increased considerably.

(ECAF Report 1951, page 19-20)

Indo-china:

Indo-china constitutes another major area of rice monoculture and surplus. Mainly due to internal disturbance, aggregate rice production of the three states, while declining sharply in the early post-war years, has been increasing recently, from about two-thirds of the pre-war volume in 1948-49 to 71 per cent in 1949/50 and 74 per cent in 1951/52. The average yield per acre reached the pre-war level in 1949/50 but subsequently declined. Total export was only 8 per cent of pre-war in 1949, but recovered to 23 per cent in 1951.

(ECAF Report 1951, page 20)

Thailand:

Rice is the staple food and major export of Thailand, employing 80 per cent. of its population and contributing 60 per cent. of its exports.

Production of milled rice was 4.3 million tons in 1951/52, as compared with 4.4 million tons in each of the years 1950/51 and 1949/50, and 2.9 million tons before the war. Thus, although output in 1951-52 was 43 per cent above pre-war, there had been some decline since the previous two years. The rice acreage in 1951-52 decreased substantially due to adverse weather conditions. The post-war yield per acre was below the pre-war level, probably as a result of less intensive methods of cultivation caused by labour shortage and, until recently, as a consequence of expanding acreage.

Export of rice has increased since 1949, when Thailand already held first place among rice exporters in the world. In 1950, the pre-war volume of export was surpassed by 7 per cent, and in 1951 by 12 per cent, reaching a total of 1.6 million tons.

(ECAF Report 1951, pages 20-21)

China:

Production of foodgrains on the mainland of China continued to improve in 1950 and 1951.

through expansion of acreage and improved yields resulting from irrigation, increased application of labour, fertilizers and insecticides, and in spite of a shortage of draught animals. Production in 1951, despite droughts, floods and insect pests, increased by some 7 per cent over 1950, although it was still 7 per cent below the pre-war level of 1936.

Before the war, the mainland of China used to have a large food import, averaging 687,000 tons of rice and 430,000 tons of wheat per year during 1934-38. Through improvement in transportation and distribution between surplus and deficit areas, there was a sizeable grain export in 1951, when 373,000 tons mostly of coarse grains were shipped to India.

With production at approximately the pre-war average level, but population increasing substantially and exports replacing imports, it would seem that the per capita supply in 1951 remained below pre-war, although it improved over the previous year.

Taiwan (China) is a rice surplus area which, before the war, exported some 650,000 tons annually. In 1951/52 rice production increased by about 3 per cent over 1950, and by 8 per cent over pre-war, partly at the expense of sugar cane acreage. The yield in 1951 increased

considerably over 1950 but was still only about 90 per cent of pre-war. There was, until 1951, a tendency for the retained supply to increase. Pre-war this was 526,000 tons. In 1950 it was 1,271,000 tons, declining, however, to 1,187,000 tons in 1951. Compared with pre-war there has also been an increase in per capita availability. How far this represents increased per capita consumption depends on changes in population and in stocks, details of which are not available.

(*ECARE Report 1951, page 21*)

Pakistan :

The food position of the country is comparatively easy. In a normal year, Pakistan has a small surplus of 300,000-500,000 tons for export. Due to the relative abundance in supply, a policy of progressive derationing and decontrol of food grains was introduced in 1948/49 and rationing has been largely abolished in the current year. There were some deficit localities in West Pakistan, and a chronic deficiency in East Pakistan, which has to import from the western part of the country. Pakistan's main problem in food supply lies in the inadequacy of transport facilities, which handicap equitable distribution between deficit and surplus areas. Per capita consumption declined somewhat in 1950/51, owing to population increases and sizeable exports.

(*ECARE Report 1951, page 22*)

PART E

Distribution of Food Grains—Government Responsibility

(i) Extract from the Indian Famine Commission Report 1880

[153.] *Activity of private trade in India.*—We have no doubt that the true principle for the Government to adopt as its general rule of conduct in this matter is to leave the business of the supply and distribution of food to private trade, taking care that every possible facility is given for its free action, and that all obstacles material or fiscal are, as far as practicable, removed. The manner in which the demand for grain in Southern India in 1877 was met by supplies sent from the North showed the promptitude with which Indian trade will operate when the facilities for transport and the profit expected are adequate. The imports by sea into the distressed districts amounted, in the two years

1876-77 and 1877-78, to about 2 millions of tons*. The total quantity of grain carried on the railways in all parts of India was double this amount†, and the actual weight conveyed by them into the famine area may have been about 1 or 1½ millions of tons, in addition to the quantity brought by sea. If, as is hence probable, the total import in the year 1877 was 2 million tons, it would at the rate of 1 ton to 6 persons for a year have been sufficient for 12 million people, or one third of the whole population affected. These results were produced by the help of a system of railways, mostly single lines, and of which only one branch traversed the worst famine tract. It is only

	Tons
*1876-77	760,000
1877-78	1,300,000
†1877	3,574,000
Est 1878	2,192,000

reasonable to anticipate that with every year's additional experience of the use to be made of the railways and telegraphs the activity and sensitiveness of Indian trade will continue to grow, and that with the new stimulus thus imparted to it, and the gradual extension of railways into districts where they do not yet exist, the power of meeting the wants of the population in time of local scarcity will be still further developed. Every interference by the Government with the operations of trade must be adverse to this tendency, and prejudicial to the growth of those habits of self-reliance which it is so essential for Government to encourage.

[154] *Extension of railways*—It is to the future extension of railways that we look as the most complete justification of our belief that the trade of the country may be confidently left to provide for the supply of food in times of scarcity. Such an extension has been going on for some years past, and it will, we trust, henceforth receive an additional impetus, as by the help of these works alone can the whole resources of the country be brought to bear in time of difficulty on any distressed area. The charge for transport between the most distant parts of India connected by rail does not now exceed one anna per seer, or $\frac{1}{4}$ d per pound, and there is reason to hope that it may be reduced to a considerably smaller sum. At the present rate grain costing 24 seers per rupee or $\frac{1}{4}$ d per pound could have been taken from Northern India to the famine districts in the south, and sold at 8 seers per rupee or $\frac{1}{4}$ d per pound, with a fair margin of profit. Such being the case we cannot doubt that with the growth of these means of communication and their continued use, all the requirements of every part of the country will be met by the natural operations of trade, without the necessity of any interference on the part of Government.

[155] *Ability of the country to feed itself.*—A resolution to rely entirely on the ordinary operations of trade to meet the wants of the country in time of famine must unquestionably rest, not only on the expected activity of the traders, but also on the probability of the requisite supplies of food being forthcoming at the critical time. The question should therefore be answered, whether there is sufficient ground for believing that the quantity of grain likely to be needed to meet the wants of such large areas as may be stricken with famine in a single year will be

certainly forthcoming. We believe that there need be no apprehension as to such a provision being forthcoming in time of famine from the parts of the country not affected, though no doubt considerable pressure would be entailed on their inhabitants in proportion to the magnitude of the export. The quantity, though large in itself, bears but a moderate ratio to the whole produce of the districts in which it may be presumed, in accordance with prolonged experience there will be no scarcity.

NOTE OF DISSENT BY JAMIL CAIRD AND
H. E. SULLIVAN

[9] Although the principles laid down, in regard to the action of Government in relation to the food supply, have our general concurrence, the evidence which we collected has led us to form the opinion that, under present conditions, it might be not only expedient, but absolutely necessary, for the State to make provision in the manner condemned by our colleagues. There are certain localities in Southern, Western and Central India which are now, and may continue to be for some time, distant from the lines of railway communication, and which are in an especial degree liable to visitations of famine. For these comparatively inaccessible tracts, which we may reckon as one fifth part of India, with a population of 40 millions, we suggest a plan of storage to show that the measure is not the financial impossibility indicated in the Report and if our views as to its necessity be accepted, we recommend its being adopted tentatively on a limited scale, leaving the extension of the operation to be decided by the success or otherwise of the experiment.

[10] The food of two-thirds of the people of India is grain, and of one third rice. The annual surplus of rice, as shown by the export, is so great that a sufficient supply from the current crop can always be relied on to meet a partial rice famine. But the export of foodgrain other than rice from India, during each of the last ten years, has been less than one day's consumption of the grain-eating population. There would thus appear to be no sufficient annual surplus within the country to meet the demand of a severe grain famine, without drawing part of their ordinary food from the unaffected districts, thereby diminishing their supply, raising the

price, and thus extending the area and general pressure of the famine. This has been the uniform effect of drawing supplies suddenly to the famine districts from other parts of India. Supplies from foreign countries are practically impossible. The densely peopled countries of other parts of Asia do not appear to export grain. And in a country where the annual surplus of grain is so small and where it cannot be increased by foreign importation, the absolute need of reserves in seasons of scarcity, for the supply of places difficult of access, becomes almost imperative. The most effectual remedy for this would be to encourage the storage of grain in such localities in seasons of plenty.

[11.] No treatment of famine has yet been successful in the preservation of life that has not been ready to be commenced at the earliest period of actual want. The food of the people is of the simplest kind, grain and salt, and a few condiments for a relish. The grain is easy to handle, bears storage in pits for many years, and the people themselves grind it as they require it. The pits are made in the ground, in a manner with which the natives are familiar, and cost nothing beyond the encircling ring of baked clay, and labour, in construction. We propose no new practice, but recommend that, in outlying places, the Government should, through their resident officials, do for the safety of the poorer class what the wealthier now do for themselves. The people live on different varieties of dry grain grown in their several districts, which is the specific food they are accustomed to. As this common grain is rarely an article of export, its storage would in no way interfere with the operation of foreign trade, and as the storage would be sub-divided in every village it could be done without disturbance to the usual operations of husbandry. In seasons of abundance stores may very conveniently be made. A village of 400 inhabitants, cultivating 400 acres of grain, may be reckoned to have 40 of the class for whom storage is here proposed. A store of seven tons would suffice for this number during a year of famine, and as severe famines on an average come as yet but once in 11 or 12 years, the quantity so required might be secured out of two years of good crops during that interval, at the rate of $3\frac{1}{2}$ tons for each time, without any pressure on the rest of the people, while the storage of that quantity of grain would be a simple and inexpensive operation.

(ii) Extract from Famine Inquiry Commission Report on Bengal—1945

The initial phase of the disturbance in the rice markets in India was the direct result of the fall of Burma. Until then, the movement of rice prices had been more subdued than that of wheat prices, even though the relation between total supply and total demand was more unfavourable in the case of rice than in the case of wheat. As long as the possibility of imports from Burma remained, there was little speculative activity in the rice markets. When Burma fell and it became plain that the areas which were largely dependent on imports from Burma, must obtain their supplies in India and nowhere else, prices of rice rose suddenly and alarmingly. This was mainly due to purchases in the rice producing areas for export to Western India, Travancore, Cochin and Ceylon, Western India, Travancore and Cochin were the areas in India which were most severely hit by the loss of imports from Burma. The figures also indicate the weight of the additional demand which the fall of Burma threw on markets in India, most of which were themselves somewhat short of supplies because of loss of imports from Burma. Unquestionably, the main factor in the disturbances in the rice markets in the summer of 1942 was the demand from areas which depended largely on imports from Burma.

Prices rose in the rice markets of India in the first instance because the need of the buyers from the areas to which we have referred was urgent and sellers in the principal markets could demand a higher price. The latter in their turn had to secure supplies from the secondary markets more quickly and in larger quantities than usual, in order to meet further demands from the outside buyers. The merchants in the secondary markets were then in a position to demand and obtain higher prices for their stocks. The rise in prices which was thus spreading could not be confined to the stocks which were purchased for export, it affected all transactions in the principal and secondary markets. It is necessary at this stage to emphasize the sharply contradictory character of the reaction of the markets to rising prices in different conditions. A rise of prices which is believed to be likely to continue, influences the minds of producers, traders, and consumers very differently from a rise of prices which is generally expected to be

temporary. In the latter case, sellers—both producers and traders—are anxious to sell before prices fall, and buyers—both traders and consumers—reduce, so far as possible, the quantities they buy. Such a reaction automatically corrects the temporary mal-adjustment between the available market supply and the demand which caused the upward movement in prices. If the mal-adjustment is corrected by an increase in supply in the market and a reduction in demand, prices fall again. This does not, however, happen when the rise in prices is sharp and unusual, and is also expected to continue. In these circumstances, it produces an exactly opposite reaction in the minds of buyers and sellers. Buyers are anxious to buy before a further rise occurs and therefore increase their purchases, while sellers are reluctant to sell because they wait for still better prices. This further decreases the supply available in the markets and increases the demand on the diminishing supply. Prices move up still further in consequence. This reinforces the fears of buyers and the greed of sellers and intensifies the market disturbances. Given sufficient time for the psychology of greed and fear generated in this manner to penetrate, on the one hand, to the primary markets and the producers—the ultimate source of supply—and, on the other hand, to the retail shops and the consumers—the ultimate source of demand—prices may rise to such an extent that large sections of the population find themselves unable to buy.

There is, therefore, no quantitative relation between the movement of prices and the volume of the additional demand which initiated the movement. Unquestionably, the volume of imports which was lost as a result of the fall of Burma and had to be met from the principal rice producing areas of India was only a very small proportion of the total supply in these areas. Nevertheless, it was the diversion of the demand formerly met from Burma to the Indian markets which started the increase of prices in the summer of 1942. The extent of the rise was out of all proportion to the disturbing cause because of its repercussions on the local markets which we have described.

Looking back, we have no doubt that in such conditions normal unrestricted trade operations could not ensure distribution at reasonable prices. A breakdown in distribution could be averted only by an intervention of Government,

which would have the effect of restoring public confidence and of demonstrating to producers and traders the determination and the ability of Government to prevent a further rise in prices, and of assuring traders and consumers that the flow of supplies would be maintained. We have also no doubt that it was this compelling necessity which led a number of Provincial and State Governments to undertake at about the same time a series of measures in restraint of trade. The measures which they adopted differed in several respects, but one measure was taken by all. Unusual exports were the original cause of the trouble. Control of exports was, therefore, the necessary first step in the attempt to control prices and ensure a satisfactory distribution of supplies. It was, however, only the first step. Other measures were necessary in order, first to deal with questions of price control and distribution within the province or state, and secondly, to ensure a flow of supplies from surplus provinces and states to deficit provinces and states

.. The rise of prices, which we hold to be the second basic cause of the famine, was something more than the natural result of the shortage of supply which had occurred. It was the result of the belief of the producers, traders and consumers in Bengal at the end of 1942 and the beginning of 1943 that an ever-increasing rise in prices was inevitable and could not be prevented. This belief had been created, not only by the failure of the aman crop but by the entire course of events during 1942.

* * * * *

(iii) Extract from the Famine Inquiry
Commission (Final) Report, 1945

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

(CHAPTER VI)

(i) The process of relaxation of existing controls is bound to present difficult problems which require to be studied in advance, and preparations for their solution must be made before they arise.

(ii) The return to normal conditions must be a gradual, regulated and co-ordinated process; otherwise the chaotic price and supply conditions which prevailed in many parts of the country in the summer of 1942 and during the greater part of 1943, may recur.

(iii) The permanent objectives of food policy have a bearing on the problems of the transition period and must be prominently kept in mind in considering these problems

(iv) The organization during the transition period should be designed, not with a view to securing the most expeditions return to pre-war conditions, but so that it can evolve into a system of regulation of prices in normal times

(v) The transition period may be regarded as commencing with the arrival of the first shipments of rice from Burma in appreciable quantities. Its probable duration is unpredictable, it may last until 1951-52

(vi) During the first stage of the transition period, it should be possible to secure the diminution and eventual elimination of wide price disparities at present existing in different parts of the country.

(vii) If the actual price which prevailed during the quinquennium ending 1938-39 are worked out in each province, and a price in the neighbourhood of 240 per cent. of such average determined, the result would broadly represent the target price level to be aimed at the end of the first stage of the transition period.

(viii) Concurrently with the reduction of prices the more stringent forms of control should be withdrawn

(ix) The main problem of the second stage of the transition would be the co-ordinated removal of cordons around provinces and states, and the re-transfer of the responsibility for distribution of supplies from Government agencies to the trade. At the same time Governments must be prepared to reintroduce controls should this be necessary, and to ensure the maintenance of the price level within pre-determined limits.

(x) Effective methods for preventing the price level from falling below a pre-determined minimum should be perfected at this time.

(xi) During this stage the price level should not be allowed to exceed 240 per cent of the pre-war level, that is, the average of the quinquennium ending 1938-39, nor allowed to fall below 180 per cent of the pre-war level

(xii) The maintenance of the suggested minimum level during the stage of the transition

period is essential to the orderly development of the country's economy.

(xiii) It is only by setting before themselves in concrete terms a definite task to perform during the transition period, and actually solving the problems involved as they arise, that Governments will acquire the basis of practical experience on which a system of regulation of prices suitable for normal times can be devised and operated.

(iv) Extract from the Report of the American Famine Mission to India 1946

India, despite a crop shortage of seven million tons, has postponed famine for the first six months of the year. This was done by means of a highly successful system of rationing and enforced procurement of food grains from cultivators. Now a six month period confronts the Indian people during which they cannot avoid famine without imports since their supplies are being rapidly exhausted . . .

No country in the world, with perhaps the exception of Russia, has gone so far in controlling basic food distribution—not even Germany under the Hitler dictatorship. As the shortages have become acute, in more and more areas monopoly procurement has been instituted. More and more of India's people have gone on rations. Lower and lower have fallen food allowances, reaching in some districts the starvation level of seven, six, even five ounces a day for adults.

The massive difficulties confronted by government can be appraised only by taking into account the fact that 60 percent of India's people are small cultivators clustered around India's 700,000 villages in which live 85 percent of the population, inadequate supplies, inadequate transport, widespread illiteracy have piled up the task to apparently impossible heights. Yet the job has been done. Popular provincial governments and skilled public administrators together have accomplished extraordinary results. Taking due account of human weakness and selfishness, it was yet found that in nearly every area visited, achievements were far above expectations. Regretably the least that was being accomplished was found in the important province of Bengal.

These food controls, by their very efficiency, have squeezed both cultivator and consumer to the point where they are now forced to lean their whole weight on the system which their co-opera-

tion supports. If this rationing and procurement system collapses, they collapse with it. By levelling out the available food so that all might share equally in its consumption, famine pockets and early deaths were avoided. But by this spreading of the deficit, the danger of mass malnutrition and acute famine was also spread. Only by keeping stocks built up to ensure a continuous flow of food can disaster for many millions be avoided . . .

These stocks can be maintained only by imports. There are not sufficient reserves among cultivators in India to avert mass starvation. Many millions of cultivators are themselves so short of food that they must draw from ration shops or starve, while it is true that enforced procurement has not cut down the food supply of cultivators as deeply in surplus areas as it has in the major deficit regions, further improvements in both procurement and rationing cannot keep the reserve up to the strength necessary for distribution.

To close the gap, India must obtain two million tons of food grains from abroad during the remainder of 1946. The greater part of this should reach India during August, September and October . . .

(v) Extracts from Minute of Dissent in the Interim Report, Foodgrains Policy Committee 1947.

[3] The most important, among the recommendations made by our colleagues runs as follows :

- (i) Acceptance of policy of reduction of Government commitments under rationing and controlled distribution
- (ii) The beginning to be made with those rationing commitments which were accepted in recent years and reduction to be effected in the reverse order to the original process of extension.

(iii) The basis of reduction to be decided with reference to local conditions with the definite aim of liquidating Government commitments as early as possible.

Our own recommendations are as follows :

- (i) No relaxation of any existing control over foodgrains during 1948

(ii) Relaxation of foodgrain control to begin as soon as possible, after supplies sufficient for honouring all commitments on 12 or basis, throughout the year, in all parts of the country are secured ; together with a margin for emergencies.

(iii) Education of the public on foodgrains control policy, and resolute enforcement.

[4] The real issue is the question of control versus decontrol. The choice is now to be made between one of the three courses as indicated below :

(i) Should decontrol of cereal foodgrains be begun and completed during 1948 ?

(ii) Should decontrol be begun in 1948 and carried out in gradual stages subsequently ?

(iii) Should the present controls be continued during 1948 ; and decontrol begun later and carried out in gradual stages subsequently ?

The recommendation made by our colleagues is so worded as to cover either the first or the second of the three courses mentioned above ; and, as would be clear from the report, our colleagues are not agreed among themselves on this point. We for our part definitely recommend the third course . . .

[5] We do not share the view of our colleagues that these problems indicate that controls have failed. On the contrary they indicate, in our opinion, the intensity of the food shortage which has been prevailing during the last two years. On the basis of this view, we explain the reasons why, in our opinion, it is essential that controls should be continued during 1948

CASE FOR CONTINUANCE OF CONTROL DURING 1948
[SECTION III]

[1] The problems which have arisen do not indicate that foodgrain controls have failed. They reflect merely the fact that the intensity of foodgrain shortage has been greater during 1946 and 1947 than in 1945, notwithstanding that import from abroad has increased.

[2.] This is seen from the following figures:

YIELD OF CEREALS (ALL INDIA)

(FIGURES IN LAKHS OF TONS)

	Jowar Total & (four Rice (Wheat Bayra cereals) average				Difference
					from
Average 5 years ending					
1943-44	282	106	112	500	
1944-45	301	108	109	518	+18
1945-46	284	92	88	464	-36
1946-47	302	81	85	468	-32

These figures show that whereas the crop which came in the market during 1945 was 18 lakhs tons better than the average of the preceding 5 years, the following two crops were smaller than the average by 36 lakhs tons and 32 lakhs tons respectively. The total short fall during the last year and this year was thus 68 lakhs tons. But the increase in imports (as compared with the average of the same five year period ending 1943-44) was only 21 lakhs tons

[3.] The imports secured during the 1946 and 1947 are not abnormally heavy. The country as a whole is normally deficit in rice. Its rice deficit has been growing steadily for over a generation. It used to be surplus in wheat, and other foodgrains including pulses. But the surplus was steadily diminishing. The trend was such that by this time, if there had been no War, the rice deficit would have increased over the pre-war level and the surplus in other grains would have vanished. These facts are indicated by the following figures:

(LAKHS OF TONS)

Period	Net imports of rice and paddy	Net imports of all foodgrains including pulses
(1) Average 5 years ending 1938-39	16	14
(2) Average 5 years ending 1933-34	11	10
(3) Average 5 years ending 1928-29	8	2
(4) Average 10 years ending 1923-24	7	---

[4.] Against the background of this past history of imports, the net imports into this country during the War and since have been as follows:

NET IMPORTS

(LAKHS OF TONS)

	Rice and Paddy	All grains
1939-40	21	22
1940-41	11	10
1941-42	7	4
1942-43	Manus 3 (Net export)	Minus 4 (Net export)
April 1943 to end of 1945	1	18
1946	3	22
First six months of 1947	3	12

[5] These figures show why there was food shortage in 1945, in spite of a good All-India crop. From about the middle of 1941 to about the end of 1945, the country was being starved of imports which were normally necessary to balance internal production and consumption. Nevertheless, it was consuming more than it produced and imported. Except for the Bengal Famine, and occasional low rations in the South, there was no effective reduction of consumption as long as the one-pound ration was maintained. On the other hand, consumption actually increased because the population was increasing, higher prices enabled the poorer producers in rural areas to eat more and sell less, and the millions in the Army and War Industries had steadier employment and better wages and did not have to go hungry. The controls which were in operation simply enabled the country to draw upon its working stocks and hold on, with its 'carry-over' diminishing from year to year.

[6] All would have been well, if increasing imports had coincided with good harvests. But instead, the poor crops of 1946 and 1947 visited the country when it was already holding a much smaller 'carry-over' than it used to in normal times. That is why no real comparison is possible between the food situation in 1946 and 1947 and the situation at any time during or before the War. The country as a whole and more particularly the South, which is normally deficit, is holding smaller 'carry-over' stocks than at any time before.

[7] The next year (1948) may be expected to be somewhat better than 1947. But even if the crop is as good, the total supply position would

not be as good as in 1945, because of the very serious further depletion of stocks which has taken place since 1945. It will take time—about two years of good crops and good imports—for the carry-over to be rebuilt to the level of 1945. Therefore, the restoration of the one-pound ration of 1945 is not likely to be possible for another two years. If that is correct, there can be no question of there being a sufficiency of stocks during next year to go round to everyone without any restriction on purchases or on the scale of consumption—even assuming that imports of the same order as last year do materialise.

[8] If this analysis is correct, and there is a real shortage in 1948, it would be extremely rash to relax controls and allow prices to rise. That controls were essential during the period 1942 to 1945, no one can seriously dispute. The Foodgrains Policy Committee of 1943, the Famine Inquiry Commission of 1944-45, and all the Governments were unanimous on this point. If controls were needed in 1945, they would be still more needed in 1948, because the supply position would be worse and the railway transport position not much better.

[9] Free-trade in a market which is seriously short of grain and known to be short, must necessarily jeopardise the lives of the poor. The process by which this happens, has been explained by the FAMINE INQUIRY COMMISSION in the following terms:

the greed of sellers and intensifies the market disturbances. Given sufficient time for the psychology of greed and fear generated in this manner to penetrate, on the one hand, to the primary markets and the producers—the ultimate source of supply—and, on the other hand, to the retail shops and the consumers—the ultimate source of demand—prices may rise to such an extent that large sections of the population find themselves unable to buy. . . .

[10] The hope that a run-away price of grain would increase the production of food, is likely to prove vain. The opposite might easily be the case. It will undoubtedly reduce consumption—but through a most dangerous method which might easily develop into uncontrollable famine.

[11.] Once such a development takes place, control will be lost in a few days and cannot be regained for months. In the conditions likely to prevail in the country during 1948, a run-away price of grain will involve not only famine, but food-riots and disorders also. If these consequences are conceded as at least probable, it would be necessary to weigh against them, the difficulties involved in facing and solving the problems which have arisen in food administration. These problems are undoubtedly serious; but they are by no means beyond solution.

[12] *Procurement difficulties*—The causes of procurement difficulties are known and have been detailed in Section II. What is now required is to increase the procurement prices in a reasonable manner and make available at fair prices, the commodities required by the producer, more particularly those which are necessary for increasing his production (e.g. manures, cattle-feed, implements, etc.). The mass of the producers in the country are reasonable people and desire only just treatment. They can be satisfied. The true boarders and black-marketeers can then be isolated and dealt with according to their deserts.

[13] *Rationing difficulties*—If the above condition is fulfilled and imports of the order we have recommended are forthcoming, it should be possible to maintain steadily throughout next year a 10 oz. ration in seriously deficit areas, and a 12 oz. ration in other areas; and to increase the volume of stocks held by Governments at the end of 1948 as compared with the stocks held at present.

[14] *Imports*—The cost of imports is at present an exceedingly difficult problem; but

it is of a temporary nature. These excessive prices are not going to last for ever. Bad crops will not be repeated year after year, and will be succeeded by good ones. The recovery of war-ravaged areas is proceeding throughout the world, and presently the exportable surpluses are likely to increase, and the demands of deficit countries are likely to diminish. It may be reasonably anticipated that probably by 1950 (and almost certainly by 1951), the position would change, and grain-exporting countries would be more anxious to find buyers than grain-importing countries to find sellers. A break in prices is bound to come. In the meanwhile, the situation would be met by a reasonable ceiling on imports, and a really effective drive in the country to increase food production rapidly. *In any event, it is not possible to eat the cake and have it. If the lifting of controls is to be hastened, imports should be increased. If imports diminish, the controls must necessarily last longer. To choke off*

imports and lift internal controls simultaneously would be to invite disaster

[15] *Unpopularity of controls*—If it is true that the consequences of decontrol would be a run-away price of grain and disorders and famine, it is obvious that Government are not likely to be any more popular with decontrol than at present. Already there are sufficient indications that classes likely to be hit by decontrol are raising their voice against it. The only remedy would appear to be to educate the public on the true nature of the shortage prevailing, the indispensability in the common interest, of controlled behaviour on the part of all good citizens, and the need for genuine public co-operation in securing maximum production, maximum procurement, maximum efficiency in distribution and austerity in consumption. The food crisis is real. It must be faced and overcome by the united efforts of all the Governments and all the people.

(vi) (a)—Extract from Table No. 3 (Food Balance Sheet) of Bulletin on Food Statistics issued
Figures for 1951 obtained separately

Name of population zone and State	Procurement			Average 1949-51 Col 2-4
	1949	1950	1951	
1	2	3	4	5
I—NORTH INDIA	444	520	420	464.7
Uttar Pradesh				
TOTAL	444	520	420	464.7
II—EAST INDIA	48	44	36	42.7
Bihar	168	116	85	123.0
Orissa	437	473	426	445.3
West Bengal	173	149	65	129.0
Assam				
Manipur				
Tripura				
Sikkim				
TOTAL	826	782	612	740.0
III—SOUTH INDIA	1,408	1,109	940	1,152.3
Madras	124	135	128	129.0
Mysore	73	69	64	68.7
Travancore-Cochin	14	9	10	11.0
Goorg				
TOTAL	1,619	1,322	1,142	1,361.0
IV—WEST INDIA	556	570	375	500.3
Bombay	15	105	55	58.3
Gujarat	2	4	5	3.7
Kutch				
TOTAL	573	679	435	562.3
V—CENTRAL INDIA	254	232	188	224.7
Madhya Pradesh	123	165	144	144.0
Madhya Bharat	139	155	165	153.0
Haryana				
Uttar Pradesh	23	25	11	19.7
TOTAL	539	577	508	541.3
VI—NORTH-WEST INDIA	146	128	125	133.0
Punjab	328	436	300	354.7
Haryana	105	158	68*	110.7
Pradesh	29	11	35	25.0
Assam		2	Negligible	2.0
Manipur				
Tripura				
Sikkim				
TOTAL	609	735	529	624.3
Grand Total	4,610	4,634	3,639	4,301.0

* 1/2 of 1951 figures reported to Government.

by the Economic & Statistical Adviser, Ministry of Agriculture (January, 1951).
from Ministry of Food & Agriculture.

(FIGURES IN THOUSAND TONS)

Net Imports (+) or Net Exports (—)				Off Takes from Government Stocks			
1949	1950	1951	Average 1949-51 Cols 6-8	1949	1950	1951	Average 1949-51 Cols 10-12
6	7	8	9	10	11	12	13
+320	+11	+255	+195 3	631	651	692	658
+320	+11	+255	+195 3	631	651	692	658
+117	+136	+765	+339 3	165	201	630	332 0
-114	-95	-6	-71 7	40	44	62	55 3
+412	+306	+543	+420 3	814	860	955	876 3
+19	+14	+100	+44 3	183	163	165	170 4
+434	+361	+1,402	+732 3	1,202	1,268	1,832	1,434 0
+396	+588	+679	+554 3	1,825	1,808	1,490	1,707 7
+131	+91	+102	+108 0	244	236	221	233 7
+351	+297	+354	+334 0	403	401	416	406 6
-12	-9	-7	-9 3	.	2	3	2.5
+366	+967	+1,128	+987 0	2,472	2,447	2,130	2,349 7
+1,074	+722	+1,074	+956 7	1,456	1,477	1,350	1,437 7
+174	+14	+108	+98 7	162	157	152	157 0
+40		+11	+25 5	35	35	16	22 0
+1,288	+736	+1,193	+1,072 3	1,653	1,649	1,548	1,616 7
+34	-106	+62	-3 3	255	195	212	221 0
+25	-59	+13	-7 0	130	113	150	146 0
+100	+91	+120	+103 7	275	282	251	270 3
-17	-10	+3	-8 0	...	19	12	15 5
+142	-84	+198	+85 3	660	610	634	634 "
+90	+50	+53	+64 3	219	187	126	151 0
+64	-199	+25	-37 3	312	203	215	255 1
-104	-107	-33	-81 3		43	20	10 0
+53	+31	+11	+31.7	82	49	46	59 2
+38	+37	+37	+37 3	35	42	47	41 "
+214	+150	+188	+184.0	210	167	112	159 5
+5	.	+4	+4.5	5	.	4	4 "
+360	-38	+253	+201 7	563	598	771	577 3
+2	.	+2	+2 0	2	.	2	2 "
+207	+212	+220	+206 3	227	221	212	219 "
+3,619	+2,165	+4,661	+3,415.7	2,690	2,614	2,725	2,676 7

(VI) (b) -- Statistics of

Prepared from reports received upto 31-3-1951 in the Basic Plan, Branch II of the Ministry of Food and Agriculture
General's Office, Ministry of

Name of Population Zone and State	1951 Census population	No. of cities	City population	No of towns	Total population	Village population	Population under statutory rationing		
							Urban	Rural	
							No of towns	Popula- tion	Popula- tion
I	2	3	4	5	6	7	8	9	10
I--NORTH INDIA									
Uttar Pradesh	63,216	16	3,908	486	4,718	54,590	51	6,868	
TOTAL	63,216	16	3,908	486	4,718	54,590	51	6,868	
II--EAST INDIA									
Bihar	40,226	5	857	108	1,848	37,521	1	256	
Orissa	14,646	1	103	37	491	14,052			
West Bengal	24,810	7	3,610	107	2,543	18,657			
Assam	9,044	Nil	Nil	29	415	8,629	40	6,513	
Manipur	578	Nil	Nil	1	3	575	12	486	
Tripura	639	Nil	Nil	1	43	596			
Nagaland	138	Nil	Nil	1	3	135			
TOTAL	90,031	13	4,570	284	5,346	80,165	53	7,255	
III--SOUTH INDIA									
Madras	57,016	13	3,379	460	7,805	45,832	75	6,159	
Mysore	9,075	3	1,182	107	997	6,896	4	1,374	
Tamil Nadu-Central	9,280	2	303	102	1,185	7,792	8	1,374	
Goa	229	Nil	Nil	2	16	213			8,322
TOTAL	75,600	18	4,864	671	10,003	60,733	87	7,533	8,322
IV--WEST INDIA									
Maharashtra	35,056	8	5,076	488	6,094	24,786	148	10,464	
Gujarat	4,137	3	374	78	1,019	2,744	3	432	
Baroda	568	Nil	Nil	10	114	454			
TOTAL	40,661	11	5,450	576	7,227	27,984	151	10,896	
V--CENTRAL INDIA									
Madhya Pradesh	21,245	2	706	138	2,172	18,370			
Bhopal	7,034	3	682	64	759	6,513			
Indore	14,155	2	1,219	170	2,257	15,179	2	372	
Ujjain	536	1	102	3	34	700	7	1,605	
TOTAL	35,975	Nil	Nil	64	306	3,269			
TOTAL	57,249	8	2,709	439	5,528	44,031	9	1,977	

rationed Population

(Food), Govt of India—Population figures are in thousands Arranged according to Zonal Divisions in Registrar Home Affairs on 4-4-1952

Population under non-statutory rationing			Population served Relief Quota Shops/Fair Price Shops			Population under controlled distribution			Total population getting supplies from Govt.
Urban		Rural	Urban		Rural	Urban		Rural	
No of towns	Population	Population	No of towns	Population	Population	No of towns	Population	Population	
11	12	13	14	15	16	17	18	19	20
		.	11	445	.		.		7313
	.		11	445				.	7313
.	.	.		@	20,636	.	.		20,892
17	416								416
42	@	3,868							10,381
	.	"				25	@	1,215	1,701
NO RATIONING—									
4 —Includes under controlled distributions						4	60		60
59	416	3,868		.	20,636	29	60	1,215	33,450
	969	5,539 3,438	242	@	16,423	.	"		28,141 5,712 1,422
2	45	.	.				.		45
2	1,014	8,997	242		16,423	.	.		42,759
								7,700	12,774 4,172 775
4	86*	482*	42	@	3,700*	.	.		
4	86*	482*	42		3,700*	.		7,700	22,464
4	1,006	...	93	C	1,710*			.	2,777
4	570		93	12	2,251*			.	7,427
						214	.	7,217	2,313
NO RATIONING									
NO RATIONING									
8	1,576	.	156		4,191*	214	.	1,215	1,941

(vi) (b)—Statistics of
 (Prepared from reports received up to 31-3-1951 in the Basic Plan, Branch II of the Ministry of Food and
 Registrar General's Office,

Name of population for State	1951 Census population	No of cities	City population	No of towns	Town population	Village population	Population under stan- dard rationing		
							Urban	Rural	
							No of Popula- tion	Popula- tion	
1	2	3	4	5	6	7	8	9	10
VI—NORTH-WEST INDIA									
Bachchan	15,291	3	589	215	2,061	12,641			
Punjab	12,641	3	648	123	1,753	10,240	19	1,706	
PHILSU	3,494	Nil	Nil	64	656	2,828			
Jammu & Kashmir	4,410								
Ajmer	693	1	196	6	101	396	2	322	
Delhi	1,744	2	1,191	8	246	307	3	321	
Pilgrimage	126			1	4	122	1	1,502	63
Himachal Pradesh	983			10	41	942			
Total	34,972††	9	2,624	427	4,872	27,476	25	3,851	63
Big Towns (A&N)	31	Nil	Nil	1	8	23	1	12	5
GRAND TOTAL	356,829††	75	24,125	2,884	37,702	295,002	377	38,392	8,390

* 1951 Census.

† Population is included in rural population.

†† Population figures are available.

‡ Population under standard rationing through the State.

§ Population under standard rationing in Tripura.

|| Population excluded here.

rationed population

Agriculture (Food), Govt. of India. Population figures are in thousands. Arranged according to Zonal Divisions in Ministry of Home Affairs on 4-4-1952.

Population under non-statutory rationing			Population served Relief Quota Shops/Fair Price Shops			Population under controlled distribution			Total population getting supplies from Govt
Urban		Rural	Urban		Rural	Urban		Rural	
No of towns	Population	Population	No of towns	Population	Population	No of towns	Population	Population	
11	12	13	14	15	16	17	18	19	20
.	.	.	115	@	3,553	46	1,635	1,962	3,597
..	508	.	.	..	.	8	154	.	5,413
45	71	.	.	..	.	.	.	.	508
22	..	.	..	..	100	..	.	.	322
.	.	.	..	..	123	.	..	.	421
.	.	.	..	..	..	.	..	.	1,688
NO RATIONING									
12	65	.	..	.	..	..	..	51	116
79	573	.	115	.	3,776	54	1,789	2,013	12,065
.	.	.	.	..	.	.	..	.	17
152	3,665	13,347	596	445	48,726	297	1,849	11,745	126,559
						No. of towns		Rationed Population (Urban & Rural)	
(a) Under Statutory Rationing						377		45,782	
(b) Under Non-Statutory rationing						152		17,012	
(c) Served through Relief Quota Shops						596		49,171	
(d) Under Controlled Distribution						297		19,594	
TOTAL						1,422		116,559	

APPENDIX VI

IRRIGATIVE PROJECTS AND IRRIGATIVE DEVELOPMENT PROJECT

APPENDIX VI

Old Irrigation Projects and Irrigation Development Projects

PART A—Irrigation development statistics

Introductory Note

TABLE I gives an abstract of the figures relating to the extent of irrigation development, cost of development of irrigation per acre, and return on capital outlay in projects in the First Five Year Plan and the earlier projects for India and the six zones. It will be seen from the table that four periods have been distinguished :

- (i) Pre-1891 ;
- (ii) 1891-1920 ;
- (iii) 1921-1940 ; and
- (iv) The period of the First Five Year Plan.

Broadly, the objective was to make this analysis for the same period as the analysis of population and cultivation (APPENDIX I, TABLES 1 to 1-8). A modification had to be made, however, in case of the period 1921-51. This period had to be divided into two parts—1921-40 and the period of the First Five Year Plan. There were two main reasons for this :

- (i) During World War II practically no work was done on irrigation projects, and
- (ii) It was felt that it would be desirable to treat the projects included in the First Five Year Plan (most of which had been started between 1947-51) as a single entity.

The figures upto 1941 relate to works in the former British provinces, because similar figures for the Indian States areas are not available. But figures for the Plan period, relate to works in the entire area of the zone. Thus, in case of South India, figures upto 1941, relate to works in the former province of Madras alone, but for the Plan period, they relate to works in Madras, Mysore, Travancore-Cochin and Coorg.

2. TABLES 2a to 2g give the data relating to important public irrigation works in the six zones of India and in Western Pakistan. The figures for these statements have been compiled from the publication—“Financial results of public and unproductive irrigation, navigation and reclamation and drainage works for and upto the end of

1943” (published by the Government of India, Department of Labour). Details for all important projects have been given statewise and include the date of first coming into operation, the date of completion, the total cost of construction, the area irrigated, the average cost of development of irrigation per acre and financial returns.

For preparing the statement for North-West India (TABLE 2f) and for Western Pakistan (TABLE 2g) it was necessary to allocate the costs and benefits of the Punjab Canals, Upper Bari Doab Canal and Sutley Valley Canals, between Indian Union and Pakistan as the area irrigated by them is partly in the Indian Union and partly in Pakistan. An *ad hoc* basis was adopted particularly for purposes of this review, as below :

I—North India

Old Irrigation Projects (for which Capital and Revenue accounts are maintained)	Before 1891	1,111	1,111	1,111
	1891-1920	1,111	1,111	1,111
	1921-1940	1,111	1,111	1,111
TOTAL Pre 1891-1940		3,333	3,333	3,333
Major Irrigation Development Plan Projects		22,222	22,222	22,222
Minor Irrigation Plan Projects		4,444	4,444	4,444

II—East India

Old Irrigation Projects (for which Capital and Revenue accounts are maintained)	Before 1891	1,111	1,111	1,111
	1891-1920	1,111	1,111	1,111
	1921-1940	1,111	1,111	1,111
TOTAL Pre 1891-1940		3,333	3,333	3,333
Major Irrigation Development Plan Projects		12,464	12,464	12,464
Minor Irrigation Plan Projects		11,724	11,724	11,724

III—South India

Old Irrigation Projects (for which Capital and Revenue accounts are maintained)	Before 1891	1,111	1,111	1,111
	1891-1920	1,111	1,111	1,111
	1921-1940	1,111	1,111	1,111
TOTAL Pre 1891-1940		3,333	3,333	3,333
Major Irrigation Development Plan Projects		5,279	5,279	5,279
Minor Irrigation Plan Projects		1,426	1,426	1,426

IV—West India

Old Irrigation Projects (for which Capital and Revenue accounts are maintained)	Before 1891	175.57	72.7	248.27
	1891-1920	330.07	180.1	510.17
	1921-1940	561.32	147.3	708.62
TOTAL Pre 1891-1940		1,070.26	380.1	1,450.36
Major Irrigation Development Plan Projects		3458.00	1051.0	4509.00
Minor Irrigation Plan Projects		835.00	797.0	1,632.00

* Figures relate to 1942-43

† Excluding Orissa for which cost of minor irrigation is not available, but the figures of area irrigated are known and have been included.

**Irrigation Development Plan Projects
for India by Zones)**

<i>Accumulated interest arrears (Rs Lakhs)</i>	<i>Accumulated surplus revenue (Rs Lakhs)</i>	<i>Total sum at charge (Rs Lakhs)</i>	<i>Net revenue* (Rs Lakhs)</i>	<i>Percentage return on total capital outlay (Col 8/2)</i>
5	6	7	8	9
...	2826.49	1081 94	141.30	13 06
331 68	10 85	643 39	6 28	2 02
711 10	0 10	2001 70	43 62	3 38
<u>1042 78</u>	<u>2837 44</u>	<u>3727 03</u>	<u>191 20</u>	<u>7 12</u>
12.34	.	280.57	17 84	6 65
1035.70	.	1670 02	4.62	0 73
..				.
<u>1048 04</u>	<u></u>	<u>1950 59</u>	<u>22 46</u>	<u>2 49</u>
457.98	2140.62	1058.57	55.48	9 24
93.66	1503 52	670.19	53 25	9.24
393 31	1	1152.53	19.24	2.53
<u>944 95</u>	<u>3644 14</u>	<u>2881.29</u>	<u>127 97</u>	<u>66 1</u>
164.67	5 71	340 50	7.31	4 16
149 49		479 59	14 00	1 21
499 50	0 14	1053 82	15 64	2 7
<u>813 66</u>	<u>5 85</u>	<u>1883 91</u>	<u>36 95</u>	<u>3 45</u>

V—Central India

Old Irrigation Projects (for which Capital and Revenue accounts are maintained) } Before 1891
 1891-1920
 1921-1940

TOTAL Pre 1940

Major Irrigation Development Plan Projects
 Minor Irrigation Plan Projects

VI—North West India

Old Irrigation Projects (for which Capital and Revenue accounts are maintained) } Before 1891
 1891-1920
 1921-1940

TOTAL Pre 1940

Major Irrigation Development Plan Projects
 Minor Irrigation Plan Projects

INDIA

Old Irrigation Projects (for which Capital and Revenue accounts are maintained) } Before 1891
 1891-1920
 1921-1940

TOTAL Pre 1940

Major Irrigation Development Plan Projects
 Minor Irrigation Plan Projects
 Supplementary Schemes (Minor)

TOTAL

Pakistan before partition

Old Irrigation Projects (for which Capital and Revenue accounts are maintained) } Before 1891
 1891-1920
 1921-1940

TOTAL Pre 1940

*Figures relate to 1942-43

†Excluding Himachal Pradesh for which cost of minor works known and have been included.

††Excluding Minor Irrigation Plan Projects in Himachal Pradesh not available.

Irrigation Development Plan Projects—*concd*

<i>Accumulated interest arrearis (Rs Lakhs)</i>	<i>Accumulated surplus revenue (Rs Lakhs)</i>	<i>Total sum at charge (Rs Lakhs)</i>	<i>Net revenue* (Rs Lakhs)</i>	<i>Percentage return on total capital outlay (Col 8/2)</i>
5	6	7	8	9
..	...	79 77	0 67	0 84
	..	570 63	5 04	0 88
<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
		650 40	5 71	0 88
<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
8 90	1635 66	377 30	69 25	18 35
	934 56	213 28	26 91	13 17
	20 58	295 64	29 46	9 96
<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
8 90	2590 80	886 22	125 62	14 32
<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
634 99	6608 48	3138 88	291 18	11 63
1619 43	2448 93	3756 24	105 73	4 95
1603 91	20 82	3084 32	113 00	3 25
<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
3858 33	9078 23	11979 44	509 91	6 28
<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
49 65	1314 21	424 26	55 45	14 80
493 46	7852 64	2585 43	409 05	19 56
86 07	115 86	4450 31	207 07	5 70
<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
629 18	9282 71	7460 02	671 57	11 10
<hr/>	<hr/>	<hr/>	<hr/>	<hr/>

TABLE 2(a)—Old Irrigation Projects and Major

Zone	Date of completion	Date when system first came into operation	Total capital outlay (Direct & Indirect) (Rs Lakhs)	Area irrigated* (000 Acres)
1	2	3	4	5
UTTAR PRADESH				
Before 1891				
PRODUCTIVE WORKS				
Upper Ganges Canal	31-3-1891	1855-56		1450
Lower Ganges Canal	31-3-1891	1879-80	449.04	1047
Eastern Jemna Canal	31-3-1891	Prior to 1830-31	420.93	358
Agri Canal	31-3-1891	1874-75	61.23	378
TOTAL			123.87	3233
UNPRODUCTIVE WORKS				
Dun Canals	31-3-1891	Prior to 1840-41	26.87	17
TOTAL			26.87	17
Period total before 1891				
(Productive & Unproductive)				
TOTAL			150.74	3250
1891-1900				
PRODUCTIVE WORKS				
Bynori Canal	31-3-1894	Prior to 1886-87	6.03	20
TOTAL			6.03	20
UNPRODUCTIVE WORKS				
Rehulhand Canals	31-3-1894	1893-94		25
Betwa Canals	31-3-1893	1886-87	23.31	168
Lakes & Tanks in Jhansi District	31-3-1894	1893-94	86.52	6
Lakes & Tanks in Hamirpur District	31-3-1894	1893-94	2.10	2
TOTAL			111.93	201
1901-1910				
UNPRODUCTIVE WORKS				
Ken Canal	31-3-1909	1908-09	62.68	133
TOTAL			62.68	133
1911-1920				
UNPRODUCTIVE WORKS				
Madan Canal	31-3-1911	1911-12	50.61	64
Ganga & Ghaghara Canals	31-3-1912	1911-12	1.86	4
Madan & Ghaghara Canals	31-3-1912	1911-12	51.80	64
Ghaghara Canal	31-3-1917	1915-16	8.48	8
Ghaghara Canal	31-3-1915	1915-16	4.73	6.2
Ghaghara Canal	31-3-1915	1914-15	4.21	1.3
Ghaghara Canal	31-3-1915	1914-15	2.30	0.8
Ghaghara Canal	31-3-1915	1914-15	5.46	2.6
TOTAL			129.45	131

				Net return (R1 Total)	Percentage return on total capital outlay (Col 10/4)
				10	11
37 22		1114 23	110 01	68 01	15 16
17 26		47 5	127 01	35 05	8 33
17 15		11 37	41 21	23 00	37 56
12 40		1 41	123 67	11 26	11 51
<u>13 62</u>		<u>1134 02</u>	<u>1055 07</u>	<u>140 38</u>	<u>13 31</u>
12 1		1 40	26 87	0 02	3 43
<u>124 01</u>		<u>1 47</u>	<u>26 87</u>	<u>0 02</u>	<u>3 43</u>
21 20		2526 10	1051 94	112 30	23 06
12 11		10 55	6 03	0 50	9 75
<u>30 32</u>		<u>10 55</u>	<u>6 03</u>	<u>0 50</u>	<u>9 75</u>
01 21	17 17		10 00	0 66	2 81
21 12	11 7		101 30	2 32	2 68
17 10	1 01		6 11	-0 02	
11 22	2 17		4 17	-0 01	
<u>46 49</u>	<u>125 07</u>		<u>212 52</u>	<u>2 91</u>	<u>2 56</u>
45 01	56 10		118 76	1 88	3 00
<u>46 94</u>	<u>56 10</u>		<u>118 78</u>	<u>1 88</u>	<u>3 00</u>
70 08	70 75		121 36	-0 30	
46 50	2 41		4 30	-0 02	
80 93	11 52		96 62	1 23	2 37
106 00	9 63		18 11	0 02	0 27
76 20	3 61		8 37	0 04	0 89
323 P1	6 41		10 65	-0 02	
237 51	2 84		5 14	-0 01	
210 00	6 05		11 51	-Neg	
<u>85 73</u>	<u>146 61</u>		<u>276 06</u>	<u>0 94</u>	<u>0 73</u>

Table 2(a)—Old Irrigation Projects and Major

Zone	Date of completion	Date when system first came into operation	Total capital outlay (Direct & Indirect) (Rs Lakhs)	Area irrigated ^a (000 Acres)
1	2	3	4	5
1891-1920				
PRODUCTIVE WORKS				
UNPRODUCTIVE WORKS			6 03	20
TOTAL			305 68	485
1921-30			311 71	505
UNPRODUCTIVE WORKS				
Sarda Canal		1928-29	1024 50	1153
Barwar Lake and Canal	31-3-1930	1922-23	7 94	4
Bela Sagar Tank	31-3-1930	1929-30	5 84	6 4
Kamalpur Tank	31-3-1930	1929-30	3 35	0 7
Jawanti Tank	31-3-1930	1929-30	10 08	0 6
Kit ham Reservoir	31-3-1921	1921-22	2 48	
TOTAL			1054 19	1165
1931-1940				
PRODUCTIVE WORKS				
Ramganga Canal	31-3-1935	1930-31	26 70	17
State Tube Wells	18-5-1934	1932-33	176 04	608
Tube well taken on lease by Government		1934-35	Neg	1 4
TOTAL			202 74	626
UNPRODUCTIVE WORKS				
Pyabad Electricity & Gogri Pumping Scheme	20-5-1936		25 10	18
Aunhar Tank & Canal	31-3-1931		4 72	1 1
Rupura Tank	16-10-1931		3 86	1 4
Kevar Nadi Scheme		1939-40		
TOTAL			33 68	21
1941-1940				
PRODUCTIVE WORKS			202 74	626
UNPRODUCTIVE WORKS			1087 87	1190
TOTAL			1290 61	1816
Projects included in the First Five Year Plan—On completion				
Major & Minor Canals			193 00	38
Tube Wells			719 00	740
Other Irrigation Schemes (Excluding schemes etc. to be completed by 1944-45)				
TOTAL			1293 00	1176
PLAN TOTAL			2205 00	1954
			2205 00	1954

^a 1941-42 to 1943-44

Irrigation Development Plan Projects—(North India)—concd

Cost per acre of area irrigated (Rs) (Col 4/5)	Accumulated interest arrears (Rs Lakhs)	Accumulated surplus revenues (Rs Lakhs)	Total sum at charge (Rs Lakhs)	Net revenue ^a (Rs Lacs)	Percentage return on total capital outlay ^b (Col 10/9)
6	7	8	9	10	11
30 15 62 98 <u>61 68</u>	331 68 <u>331 68</u>	10 85 <u>10 85</u>	6 03 637 36 <u>643 39</u>	0 59 5 73 <u>6 32</u>	9 75 1 87 <u>2 03</u>
88 86 198 50 92 70 478 57 1680 00 . <u>90 49</u>	626 22 9 04 4 11 2 48 9 32 2 82 <u>653 99</u>	... . . . .. .. <u>...</u>	1650 72 16 98 9 94 5 83 19 40 5 30 <u>1708 17</u>	38 05 0 05 Neg Neg —0 07 —0 06 <u>37 95</u>	3 71 0 60 <u>3 60</u>
157 05 28 95 . <u>32 38</u>	26 10 16 13 . <u>42 23</u>	. . 0 10 <u>0 10</u>	52 80 192 16 Neg <u>244 96</u>	—0 04 6 22 0 13 <u>6 31</u>	3 53 . . <u>3 11</u>
139 44 429 09 275 71 . <u>160 38</u>	7 13 4 23 3 41 0 06 <u>14 88</u>	. . .. .. <u>...</u>	32 23 9 01 7 27 0 06 <u>48 57</u>	—0 62 —0 01 —0 01 —0 64 <u>6 31</u>	1 00 3 11 3 43 3 15 <u>3 15</u>
32 38 91 44 <u>71 06</u>	42 23 668 87 <u>711 10</u>	0 10 <u>0 10</u>	244 96 1756 74 <u>2001 70</u>	6 31 37 31 <u>43 62</u>	3 11 3 43 <u>3 15</u>
507 8 97 16 <u>109 94</u> <u>...</u> <u>...</u> <u>...</u> <u>...</u> <u>...</u>
112 84 <u>112 84</u>	. <u>.</u>	<u>...</u>	<u>...</u>	<u>...</u>	<u>...</u>

Table 2(b)—Old Irrigation Projects and Major

Zone	Date of completion	Date when system first came into operation	Total capital outlay (Direct & Indirect) (Rs Lakhs)	Area irrigated* (000 Acres)
1	2	3	4	5
Before 1891				
BIHAR				
PRODUCTIVE WORKS				
Son Project	31-3-1981	1875	268.43	510
TOTAL			268.43	510
1891-1900				
UNPRODUCTIVE WORKS				
BENGAL				
Midnapore Canal	1889	..	84.92	66
ORISSA				
Orissa Canals System	31-3-1895	1865	271.87	233
Rushakulya System	31-3-1901	1892-93	56.14	114
TOTAL			412.93	413
1901-1910				
UNPRODUCTIVE WORKS				
BIHAR				
Djela Canal	31-3-1908	1906-07	6.32	11
TOTAL			6.32	11
1911-1920				
UNPRODUCTIVE WORKS				
BENGAL				
Damodar Canal			126.33	162
Deekshwar Irrigation Scheme			7.14	7
BIHAR				
Tribeni Canal	31-3-1914	1911-12	81.58	107
TOTAL			215.05	276
1921-1930				
PRODUCTIVE WORKS				
UNPRODUCTIVE WORKS				
TOTAL			634.30	700
*Figures relate to 1942-43				
			634.30	700

Irrigation Development Plan Projects—(East India)

Cost per acre of area irrigated (Rs) (Col. 4/5)	Accumulated interest arrows (Rs Lakhs)	Accumulated surplus revenue (Rs Lakhs)	Total sum at charge (Rs Lakhs)	Net revenue* (Rs Lakhs)	Percentage of total cost of outlay (Col. 10/11)
6	7	8	9	10	11
52 63	12 34		280 57	17 84	6 65
52 63	12 34		280 57	17 84	6 65
128 66	203 38		288 30	—0 03	
116 61	650 29	.	922 16	Neg	
49 25	54 89	...	111 03	0 87	1 55
99 97	908 56	...	1327 49	0 84	0 20
57 45	3 27		9 60	0 24	3 50
57 45	3 27	.	9 60	0 24	3 50
77 98	39 97	...	166 30	1 00	1 00
102 00	4 57	...	11 71	—0 1	
76 24	79 33	.	160 02	1 70	2 1
77 92	123 87	...	335 93	3 01	1 10
...
90 61	1035 70	..	1670 02	1 12	.
90 61	1035 70	..	1670 02	1 12	..

Table 2 (b)—Old Irrigation Projects and Major

Zone	Date of completion	Date when system first came into operation	Total capital outlay (Direct & Indirect) (Rs Lakhs)	Area irrigated* (000 Acres)
1	2	3	4	5
BIHAR				
Sikri (Upper Valley) Irrigation			93 00	60
Tubewells			590 00	434
Other Irrigation Schemes			731 00	358
TOTAL			1414 00	852
ORISSA				
Hirakud Dam			6379.00@	1,785
Other Irrigation Works			402 00	502
TOTAL			6781 00	2287
WEST BENGAL				
Demodar Valley Projects			2222 00@	1,141
Mayurakshi			1458 00@	600
Sonarpur Arrah Panch Maita Scheme			105 00	46
Bapde Ghunti Jantargachhi			99 00	26
Other Irrigation Schemes			187 00	333
TOTAL			4071 00	2246
ASSAM				
Other Irrigation Schemes			200 00	218
TOTAL			200 00	218
PLAN TOTAL			12466 00	5503

* Figures relate to 1942-43.

@ Co. of Irrigation portion only.

Irrigation Development Plan Projects—(East India)—concl'd.

<i>Cost per acre of Area irrigated (Rs) (Col. 4/5)</i>	<i>Accumulated interest arrears (Rs Lakhs)</i>	<i>Accumulated surplus revenue (Rs Lakhs)</i>	<i>Total sum at charge (Rs Lakhs)</i>	<i>Net revenue* (Rs Lakhs)</i>	<i>Percentage return on total capital outlay (Col. 10/4)</i>
6	7	8	9	10	11
155 0
135 9
204 2
<u>165 9</u>
357 4
80 1
<u>296 5</u>
194 7
243 0
228 3
380 8.
56 1
<u>190 0</u>
91.7
<u>91.7</u>
<u>226.5</u>

Table 2(c)—Old Irrigation Projects and Major

Zone	Date of completion	Date when system first came into operation	Total capital outlay (Direct & Indirect) (Rs Lakhs)	Area irrigated* (000 Acres)
1	2	3	4	5
before 1891				
MADRAS				
PRODUCTIVE WORKS				
Godavari Delta System	31-3-1890	1877-78	190.84	955.0
Cauvery Delta System	31-3-1889		83.03	129.0
Sivakumari Ancient System	31-3-1889		17.75	18.0
Pennar River Canals System	31-3-1894	1860-61	70.57	86.0
TOTAL				
			362.19	1188.0
UNPRODUCTIVE WORKS				
Kurnool Cuddapah Canal	Not known	1882-83	233.87	94.0
Barur Tank	31-3-1891		4.52	2.5
TOTAL				
			238.39	96.5
1891-1900				
MADRAS				
PRODUCTIVE WORKS				
Mecheruvattu Ancient System	March 1891			
Thadimalu Channel System	1893		0.87	4.0
Kalagarayan Channel System	1893		1.77	8.0
Vridhachalam Ancient System	31-3-1893		1.80	7.0
Chinnambakkam Tank System	31-3-1893		1.08	8.0
Marudur Ancient System	1893		7.64	2.0
Ayraloth Channel System	31-3-1894		0.60	14.0
Tirukkottai Ancient System	31-3-1895		2.44	3.0
Shenoi Ancient System	31-3-1895		3.99	18.0
Chervu Ancient System	31-3-1895		10.90	37.0
Gumbum Tank System	31-3-1895		5.40	17.0
Poona Ancient System	31-3-1895		0.86	1.3
Pervur System	1897		3.04	1.8
Krishna Delta System	31-3-1897	1896-97	108.36	103.0
Narayan Channel System	31-3-1898		224.06	849.0
TOTAL	1899	1895-96	0.66	3.0
			372.47	1075.1
UNPRODUCTIVE WORKS				
Water Supply & Irrigation	31-3-1893		0.76	0.4
Puducherry Ancient System	1893		18.69	2.0
Chinnambakkam System	1893		6.92	11.6
Chinnambakkam R. System	31-3-1896		24.89	11.1
TOTAL	31-3-1900		2.89	19.6
			54.15	44.7

* For details see 12, 2-43

Irrigation Development Plan Projects—(South India)

Cost per acre of area irrigated (Rs) (Col. 4/5)	Accumulated interest arrears (Rs. Lakhs)	Accumulated surplus revenue (Rs. Lakhs)	Total sum at charge (Rs Lakhs)	Net revenue* (Rs Lakhs)	Percentage return on total capital outlay (Col 10/4)
6	7	8	9	10	11
19 98	.	1513.49	190 84	38 18	20 0
64.36		506 01	83 04	7 98	9 61
98 61		0 79	17.75	0 69	3 36
82 06		115 33	70 57	6 25	8 85
30 49		2140 62	362 20	53 10	14 66
248 79	453 23		687 10	2 27	0 97
180 08	4 75		9 27	0 11	2 50
247 03	457.98	.	696 97	2 38	1 00
21 75	.	3 71	0 87	0.05	5 96
22 13		19 31	1 77	0 54	30.19
25 71	.	7 61	1 80	0 26	14 55
13 50	..	6 74	1 08	0 08	7.05
382 00	.	4 57	7 64	—0 08	...
4 29	..	4 71	0 60	0.40	66 87
48 00	...	1 09	1 44	0.17	11 89
22.17	...	8 57	3.99	0 17	4.29
29.46	...	47.91	10.90	0.89	8.18
31.76	...	0.29	5.40	0.29	5 54
66 15	..	0.13	0.86	—0.07	...
168.88	..	13 66	3.04	—0.41	...
106.23	..	37.30	108.36	6.50	6 00
26 39	.	1192 99	224 06	37.25	16 63
22 00	..	0 28	0 66	0.11	16.71
34 64		1348 87	372 47	46.15	22 39
190 00	0.61	---	1 37	—0 01	.
934 50	29 98	.	48.67	0 17	0 93
59.65	4 96	..	11 88	0 05	1 10
224 23	8.13	.	33 07	—0 9	6 83
14 74	.	7 44	2 89	0 20	...
121 14	43 73	7 44	97 88	—0 54	—1 07

Table 2(c)—Old Irrigation Projects and Major

Zone	Date of completion	Date when system first came into operation	Total capital outlay (Direct & Indirect) (Rs Lakhs)	Area irrigated* (000 Acres)
1	2	3	4	5
1901—1910				
PRODUCTIVE WORKS				
Lower-Coleroon Ancient System .	30-6-1903		30 02	85 0
TOTAL . . .			30 02	85 0
UNPRODUCTIVE WORKS				
Munivara System	1901—02	1898—99	6 10	9 0
Dondapad Tank . .	31-3-1903	1898—99	1 40	0 4
Yetur Tank . . .	31-3-1907	1912—13	0 63	1 3
Sagileru System . .	31-3-1907	1898—99	4 65	2 28
Attur Tank . . .	31-3-1907	1912—13	1 25	0 5
Jangamshettarapuram Tank	31-3-1908	1912—13	0 72	0 15
TOTAL . . .			14 75	11 4
1911—1920				
MADRAS				
PRODUCTIVE WORKS				
Kistna East Bank Canal Extension System	31-10-1913	1917—18	58 40	77 0
TOTAL . . .			58 40	77 0
UNPRODUCTIVE WORKS				
Aravastamadden Berapeti Tank .	31-3-1910	1911—12	0 74	— 0 2
Hasturam Tank . . .	31-3-1911	1910—11	3 12	0 8
Portakur Tank . . .	31-3-1911	1910—11	2 19	0 8
Arakapur Tank . . .	31-3-1911	1909—10	1 29	0 7
Narmadi River System . . .	31-3-1913	1909—10	17 67	14 0
Verkarapuram Tank . . .	31-3-1918	1921—22	3 85	0 3
Bhaskara Tank . . .	31-3-1919	1921—22	2 65	0 6
Yellur Tank . . .	31-3-1919	1920—21	2 70	0 5
Paripati Reservoir System . .	30-6-1919	1924—25	3 39	
Siddipet Tank . . .	31-10-1919	1921—22	8 04	1 0
Narasara Awaru & Supply Channel . . .	31-12-1919	1920—21	1 10	0 2
TOTAL . . .			46 74	18 7
1921—1920				
			460 89	1237 1
			115 64	74 8
			576 53	1311 9

Irrigation Development Plan Projects—(South India)—*contd.*

Cost per acre of area irrigated (Rs) (Col 4/5)	Accumulated interest arrears (Rs Lakhs)	Accumulated surplus Revenue (Rs Lakhs)	Total sum at charge (Rs Lakhs)	Net Revenue* (Rs Lakhs)	Percentage return on total capital outlay (Col 10/4)
6	7	8	9	10	11
75 32		138 50	30 02	1 21	4 02
35 32		138 50	30 02	1 21	4 02
67 78	2 89		8 99	0 32	5 21
350 00	2 07		3 47	0 01	1 02
48 46	0 61		1 24	0 01	2 04
.	8 11		12 76	-0 03	
250 00	1 17		2 42	Neg	
480 00	0 75		1 47	Neg	
129 38	15 60		30 35	0 31	2 10
75 84		8 71	58 40	5 25	8 99
75 84		8 71	58 40	5 25	8 99
	0 96		1 69	-0 02	
390 00	2 96		6 08	0 01	0 42
273 75	2 69		4 88	Neg	
184 28	1 24		2 53	-0 03	
126 21	4 95		22 62	0 73	4 13
1283 33	4 18		8 03	0 004	0 11
441 66	2 55		5 21	0 03	1 09
540 0	2 35		5 05	0 003	0 10
	3 49		6 88	-0 03	
804 00	8 11		16 15	0 04	0 46
550 00	0 85		1 95	0 005	0 41
249 95	34 33		81 07	0 74	1 59
37 26		1496 08	460 89	52 61	11 41
154 59	93 66	7 44	209 30	0 51	0 44
43 95	93 66	1503 52	670 19	53 22	9 21

Table 2(c)—Old Irrigation Projects and Major

Zone	Date of completion	Date when system first came into operation	Total capital outlay (Direct & Indirect) (Rs Lakhs)	Area irrigated* (000 Acres)
1	2	3	4	5
1921-30				
MADRAS				
Protective Works				
Pichavaram Island System	28-2-1934	1929-30	16 96	31 0
Cauvery Mettur System	30-9-1934	1932-33	650 80	133 0
Kaveri System		1929-30	41 22	51 0
TOTAL			708 98	215 0
Unproductive Works				
Upper Peracoor System	30-6-1921	1921-22	23 91	3 7
Kannampally Peracoor	31-3-1922	1924-25	1 11	0 3
Tiruvodur Peracoor System	31-3-1925	1924-25	26 23	24 0
TOTAL			50 25	28 0
Projects included in the First Five Year Plan—On Completion				
MADRAS				
Madhavaram	"	"		
Madhavaram	"	"	951 00	207 0
Mettur Canal	"	"	380 00	40 0
Mettur Canal	"	"	245 00	45 0
Mettur Canal	"	"	398 00	20 0
Mettur Canal	"	"	102 00	8 0
Mettur Canal	"	"	95 00	3 0
Mettur Canal	"	"	100 00	7 0
Mettur Canal Schemes	"	"	1970 00	250 0
TOTAL			709 00	28 0
			4960 00	608 0
MYSORE				
Mysore Project (1st Stage)	"	"	2000 00	180 0
Mysore Project (2nd Stage)	"	"	200 00	21 0
Mysore Project (3rd Stage)	"	"	220 00	20 0
Mysore Project (4th Stage)	"	"	289 00	29 0
TOTAL			2709 00	250 0
TRAVANCORE-COCHIN				
			173 00	46 0
			120 00	50 0
			120 00	31 0
			197 00	41 0
			610 00	168 0
			8279 00	1026 0

Irrigation Development Plan Projects (South India)—*conold*

Cost per acre of area irrigated (Rs) (Col 4/5)	Accumulated interest arrears (Rs Lakhs)	Accumulated surplus revenue (Rs Lakhs)	Total sum at charge (Rs Lakhs)	Net revenue* (Rs Lakhs)	Percentage return o total capital outlay (Col 10/4)
6	7	8	9	10	11
54 70	1 25		18.21	0 68	4 02
489.31	334 51		985 31	17 63	2 71
80 82	20 06		61 28	—0 04	
<u>329 76</u>	<u>355 82</u>		<u>1,064 80</u>	<u>18 27</u>	<u>2 58</u>
619.18	20 73		43 64	0 09	0 41
370 00	1 35		2 46	—0 11	
109.29	15 41		41 63	0.99	3 78
<u>179 46</u>	<u>37 49</u>		<u>87 73</u>	<u>0 97</u>	<u>1 93</u>
464 21					
950 01					
544 4					
1,890 0					
1,275 0					
3,166 6					
1,428 5					
788 0					
2,532 1					
<u>815 8</u>	<u>"</u>				
1,111 11					
952 3					
1,100 0					
996 5					
<u>1,083 6</u>					
376 1					
240 0					
387 1					
480 5					
<u>363 1</u>	<u>"</u>				
<u>806 92</u>					

Table 2(d) Old Irrigation Projects and Major

Zone	Date of construction	Discharge of water in cusecs	Estimated beneficial area in acres	Benefit in tons per acre
1	2	3	4	5
Before 1891				
BOMBAY				
PRODUCTIVE WORKS				
Gadkari Tank	1851-52	1552	17	0.4
Mavinkop Tank	1851-52	1552	0.5	0.6
Elaruk Tank	1890-91	1552	13.4	5.4
TOTAL			13.91	6.3
UN-PRODUCTIVE WORKS				
Kasurdi Tank	1877-78	1560-70	0.46	0.4
Chikhli Canal	1852-53	1570-71	0.57	14.4
Hathmati & Kharcut Canal	1853-54	1572-73	13.16	0.5
Dambal Tank	1854-55	1550-51	0.64	0.1
Madiari Tank	1855-56	1551-52	0.51	0.1
Hartala Tank	1856-57	1552-53	0.73	0.5
Mhaswa Tank	1856-57	1577-78	1.20	0.5
Madag Tank	1858-59	1866-67	1.65	0.5
Asundi Tank	1859-60	1554-55	0.75	0.2
Muchkundi Tank	1890-91	1554-55	1.54	1.1
Bhadalvadi Tank	1890-91	1551-52	2.22	0.3
Bhatodi Tank	1891-92	1571-72	3.75	0.6
Koregaon Tank	1891-92	1868-69	0.30	5.6
Krishna Canal	1891-92	1869-70	0.50	0.3
Upperman River Works	1891-92	1572-73	4.34	1.2
Maini Tank	1891-92	1575-76	1.96	4.4
Ashti Tank	1892-93	1551-52	5.42	0.7
Revani Canal	1892-93	1865-66	0.60	0.3
Shirsuphal Tank	1892-93	1879-80	2.25	2.5
Lower Pimhra River Works	1893-95	1551-52	1.64	1.5
Yarla River Irrigation Works	1895-96	1869-70	7.82	16.8
Mutha Canal incl. Matoba Tank	1896-97	1874-75	70.20	2.4
Jamda Canal	1901-02	1870-71	10.51	6.2
Kadwa River Works	1907-08	1868-69	10.36	
TOTAL			161.96	66.4
Before 1891 TOTAL			175.87	72.7

NOTE.—Figures relate to 1942-1943

Irrigation Development Projects (West India)

Cost per acre of area irrigated (Rs) (Col 4/5)	Accumulated interest arrars (Rs Lakhs)	Accumulated surplus revenue (Rs Lakhs)	Total sum at charge (Rs Lakhs)	Net revenue* (Rs Lakhs)	Percentage return on total capital outlay (Col 10/4)
6	7	8	9	10	11
42 50	.	0 69	0 17	0 01	6 74
68 00	.	0 03	0 34	0 02	4 72
248 13		4 99	13 40	1 75	13 06
220 79		5 71	13 91	1 78	12 80
142 50	1 33		1 79	0 03	6 52
91 60	1 30		1 87	0 004	0 68
213 33	16 60		29 79	-0 01	
810 00	1 95		2 59	-0 05	
730 00	1 99		2 80	-0 01	
278 00	1 03		1 76	0 02	2 74
336 00	3 09		4 48	0 02	1 44
375 00	4 38		6 06	0 002	0 13
	1 33		2 08	Neg	
206 36	3 25		4 83	0 002	0 10
1,263 33	4 13		6 40	0 03	1 25
65 00	8 51		12 30	0 04	0 96
110 47	1 19		1 58	-0 03	
1,463 33	3 97		13 47	0 46	4 67
413 33	10 88		15 27	-0 03	
191 36	9 34		14 30	0 03	0 63
85 71	14 89		23 31	0 09	1 07
750 00	0 72		1 32	-0 01	
187 60	4 52		6 76	0 02	0 33
173 78	4 13		8 81	0 17	3 61
417 86	15 77		23 59	0 16	2 02
437 91	29 38		99 57	4 00	5 70
167 10	3 52		14 03	-0 04	
	17 47		27 83	0 58	5 61
243 92	164 67		326 59	5 48	3 41
241 91	164 67	5 71	340 50	7 26	4 16

Table 2(d)—Old Irrigation Project and Major

Zone	Date of completion	Date when system first came into operation	Total capital outlay (Direct & Indirect, (Rs Lakhs)	Area irrigated (000 Acres)
1	2	3	4	5
1891-1900				
BOMBAY				
UN-PRODUCTIVE WORKS				
Pearul Tank	1895-96	1889-90	2 15	0 3
Gulab Canal Is. Section & Storage Works	1896-97	1884-85	15 63	12 2
Wastad Tank	1896-97	1884-85	20 96	2 5
TOTAL			38 74	15 0
PRODUCTIVE WORKS				
1901-1910				
BOMBAY				
UN-PRODUCTIVE WORKS				
Pavari Tank	1901-02	1906-07	6 43	1 1
Nira Left Bank Canal	1905-06	1885-86	147 08	74 1
Wangroli Tank	1908-09	1904-05	2 93	1 3
Farza Nagrama Tank	1909-10	1904-05	2 81	0 2
Sakh Tank	1909-10	1908-09	2 55	1 7
Chivakpur Tank	1909-10	1909-10	20 80	11 6
TOTAL			182 60	90 0
1911-1920				
UN-PRODUCTIVE WORKS				
Gadavari Canal	1915-16	1911-12	106 59	45 9
Puduch Canal	1916-17	1915-16	1 16	0 13
Dharna Canal	1921-22	1915-16	0 98	9 1
TOTAL			108 73	55 1
1921-1920				
PRODUCTIVE WORKS				
UN-PRODUCTIVE WORKS				
TOTAL			330 07	160 1
1921-30				
PRODUCTIVE WORKS				
TOTAL			330 07	160 1
1921-30				
PRODUCTIVE WORKS				
Sakh to Chivak	1921-22	1922-23	1 08	2 4
TOTAL			1 08	2 4

Irrigation Development Plan Projects (West India)—contd

<i>Cost per acre of area irrigated (Rs.) (Col 4/5)</i>	<i>Accumulated interest on loans (Rs Lakhs)</i>	<i>Accumulated surplus revenue (Rs Lakhs)</i>	<i>Total sum at charge (Rs Lakhs)</i>	<i>Net revenue¹ (Rs Lakhs)</i>	<i>Percentage return on total capital outlay (Col 10/4)</i>
6	7	8	9	10	11
716 67	3 39		5 54	0 0 3	1 39
128 11	4 12		19 74	0 57	3 67
838-40	33 45		54 41	0 38	1 83
<u>258 26</u>	<u>40 96</u>		<u>79 69</u>	<u>0 98</u>	<u>2 53</u>
			...		
584-54	6 63		13 06	0-06	0-87
198 49	12 28		159-35	7 38	5 02
225 38	3 52		6 45	0 005	0 18
1,405-00	3 80		6 61	0 001	0-04
150 00	3 24		5 79	0 05	1 96
179 31	21 19		41 99	1 37	6 59
<u>202 88</u>	<u>50 66</u>		<u>233 25</u>	<u>8 88</u>	<u>4 86</u>
232 22	54 69		161 28	4 23	3 96
892 30	1 54		2 71	0 08	
10-77	1 64		2 62	0 001	0 11
<u>197 33</u>	<u>57 87</u>		<u>166 61</u>	<u>4 14</u>	<u>3 81</u>
206 16	149 49		479 55	14 00	4 24
<u>206 16</u>	<u>149-49</u>		<u>479 55</u>	<u>14 00</u>	<u>4 24</u>
45-00		0 14	1 08	0 04	3 52
<u>45-00</u>	<u>..</u>	<u>0 14</u>	<u>1 08</u>	<u>0 04</u>	<u>3 52</u>

Irrigation Development Plan Projects (West India)—*concl'd*

Cost per acre of area irrigated (Rs.) (Col. 4/5)	Accumulated interest amounts (Rs. Lakhs)	Accumulated surplus revenue (Rs. Lakhs)	Total sum at charge (Rs. Lakhs)	Net revenue* (Rs. Lakhs)	Percentage return on total capital outlay (Col. 10/4)
6	7	8	9	10	11
213 30	106 11		257 13	8 14	5 39
<u>213 30</u>	<u>106 11</u>	<u>—</u>	<u>257 13</u>	<u>8 14</u>	<u>5 39</u>
556 30	393 39		805 61	7 46	1 51
<u>556 30</u>	<u>393 39</u>	<u>—</u>	<u>805 61</u>	<u>7 46</u>	<u>1 51</u>
45 00		0 14	1 08	0 04	3 52
388 71	499 50		1,062 74	15 60	2 77
<u>383 11</u>	<u>499 50</u>	<u>0 14</u>	<u>1,063 82</u>	<u>15 64</u>	<u>2 77</u>
742 2					
545 0					
472 2					
186 5					
750 0					
<u>287 2</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
568 2					
370 3					
N A					
812 7					
<u>668 3</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
239 5					
<u>239 5</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
329 0					
<u>329 0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>

Table 2(c)—Old Irrigation Projects and Major

Zone	Date of completion	Date when work first commenced operation	Total cost of project Rupees Lakhs	Area irrigated Hectares
1	2	3	4	5
1901-1910				
MADHYA PRADESH				
UN-PRODUCTIVE WORKS				
Khapri-Aranda	March 1909	1907-07	2.62	9.9
Morwadwa . .	March 1909	1905-05	1.77	3.4
Phadraon . .	March 1909	1904-06	2.34	7.4
TOTAL			6.74	20.7
1911-1920				
UN-PRODUCTIVE WORKS				
Roomal	Nov 1911	Oct 1909	3.17	2.6
Ramtek Reservoir .	Feb 1914	Oct 1909	27.94	12.6
Khar-Banda . .	Mar 1915	1905-06	7.11	9.7
Chandpur	Oct 1915	Sep 1907	6.54	9.1
Asola Menaha . .	Mar 1918	Sep 1911	18.27	16.6
Newar Tar Ametha Reservoir	Jan 1919	1900-10	3.53	0.5
Bareilly-Kalan with Nohari feeder	Mar 1920	Mar 1911	2.34	1.0
TOTAL			70.03	52.7
1921-1930				
UN-PRODUCTIVE WORKS				
TOTAL			79.77	69.3
1931-1939				
UN-PRODUCTIVE WORKS				
Jamnina . .	Mar 1922	Aug 1916	5.41	5.3
Katanghen . .	Mar 1922	Mar 1916	2.00	1.3
Ghorajhen	Mar 1923	Aug 1910	11.46	7.8
Tandula Canal	Mar 1923	1917-18	120.24	145.5
Nalchwar	Mar 1923	Jul 1916	7.01	3.0
Chorhamara . .	Mar 1923	1918-19	10.31	10.2
Bodalkhara . .	Mar 1923	Aug 1916	7.01	10.0
Borinwala	Mar 1923	1920-21	6.49	0.5
Wanganga Canal .	Mar 1923	Aug 1916	53.22	58.0
Mahanadi Canal	Mar 1927	1914-15	158.45	192.0

*Figures relate to 1942-43

Irrigation Development Plan Projects (Central India)

Cost per acre of area irrigated (Rs) (Col 4/5)	Accumulated interest arrears (Rs Lakhs)	Accumulated surplus revenue (Rs Lakhs)	Total sum at charge (Rs Lakhs)	Net revenue* (Rs Lakhs)	Percentage return on total capital outlay (Col 10/4)
6	7	8	9	10	11
36 57				0 10	2 86
111 18				0 06	1 57
60 00				0 04	1 54
<u>56 63</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>0 20</u>	<u>2 05</u>
121 92		..		0 03	0 95
221 82	.	.		0 09	0 34
78 45	.			0 08	1 02
75 27	0 09	1 38
110 06	0 19	1 06
766 00	Neg	.
235 00	<u>---</u>	<u>---</u>	<u>---</u>	<u>0 01</u>	<u>0 67</u>
134 41	<u>---</u>	<u>---</u>	<u>---</u>	<u>0 47</u>	<u>0 84</u>
115 11	<u>---</u>	<u>---</u>	<u>---</u>	<u>0 67</u>	<u>0 84</u>
115 11	<u>---</u>	<u>---</u>	<u>---</u>	<u>0 67</u>	<u>0 84</u>
10 40		...		0 08	1 49
153 84	0 02	0 85
146 92			...	Neg	..
82 64	1 59	1 32
233 66		0 02	0 35
101 08				0 06	0 57
70 10		.		0 07	0 96
1,298 00		...		Neg	0 03
91 76				0 62	1 16
32 53	.			1 70	1 03

Table 2(c)—Old Irrigation Projects and M. for

Zon	Date of completion	Date when first completed (year)	Estimated cost (Rs. lakhs)	Actual cost (Rs. lakhs)
1	2	3	4	5
Pariat	Mar 1927	1925-26	-	-
Jagwa	Mar 1927	1925-26	-	-
Kuseria	Mar 1927	1926-27	-	-
Kumhari	Mar 1927	1922-23	-	-
Chandunala	Mar 1927	1925-26	-	-
Amari	Mar 1927	1925-26	-	-
Boni	Mar 1927	1926-27	-	-
Bohanbund	Mar 1928	1926-27	-	-
Mala	Mar 1928	1922-23	-	-
Kharung	Mar 1931	1927-28	20	12
Manari	Mar 1933	Jul 1930	44.45	54.0
TOTAL			570.63	593.0
1921-1940				
UN-PRODUCTIVE WORKS			570.63	593.0
TOTAL			570.63	593.0
Projects included in the First Five Year Plan—on completion			570.63	593.0
MADHYA PRADESH				
Dudhwa			140.00	00.0
Other Irrigation Schemes			219.00	04.0
TOTAL			359.00	184.0
MADHYA BHARAT				
Irrigation Schemes			334.00	152.0
TOTAL			339.00	152.0
HYDERABAD				
Tungabhadra			2,304.00	450.0
Rajolimbunda			430.00	79.0
Godavari 1st Phase			441.00	53.0
Other Irrigation Schemes			251.00	140.0
TOTAL			3,426.00	722.0
PLAN TOTAL			4,334.00	1,067.0

*Figures relate to 1942-43

Irrigation Development Plan Projects (Central India)—*contd*

<i>Cost per acre of area irrigated (Rs) (Col 4, 5)</i>	<i>Accumulated interest payments (Rs Lakhs)</i>	<i>Accumulated surplus revenue (Rs Lakhs)</i>	<i>Total sum at charge (Rs Lakhs)</i>	<i>Net revenue* (Rs Lakhs)</i>	<i>Percentage return on total capital outlay (Col 10/4)</i>
6	7	8	9	10	11
1,843 00				0 18	0 98
1,123 30				Neg	
460 00				Neg	
110 69				0 07	1 12
345 88				0 01	0 14
406 67				Neg	0 07
219 78'				0 07	0 70
565 21				0 006	0 05
224 86				0 01	0 14
71 12				0 34	0 59
100 98				0 19	0 34
96 23				5 04	0 88
96 23				5 04	0 88
96 21				5 04	0 88
166 6					
233 0					
200 5					
223 0					
223 0					
512 0					
544 3					
832 1					
168 4					
468 6					
387 4					

Table 2-F Old Irrigation Projects and Major

Zone	Date of completion	Date of first completion	Area in acres	Cost in lakhs
1	2	3	4	5
Before 1891				
PUNJAB (I)				
PRODUCTIVE WORKS				
Upper Bari Doab Canal	1878-79	1862-61	1	1
Sirhind Canal	1885-87	1864-63	1	2
TOTAL			127	3,745
1891-1900				
PUNJAB (I)				
PRODUCTIVE WORKS				
Western Jumna Canal	1894	1891-92	270	1
TOTAL			270	287
UN-PRODUCTIVE WORKS				
Ghaggar Canals	1898-99	1907	3	2
TOTAL			3	2
1891-1920				
PUNJAB (I)				
PRODUCTIVE WORKS				
			200	899
UN-PRODUCTIVE WORKS				
			3	2
TOTAL			204	914
1921-1940				
PUNJAB (I)				
PRODUCTIVE WORKS				
Sutlej Valley Project (1/3)	31-3-1933	1926-27	295	636
TOTAL			295	636
1921-1940				
PUNJAB (I)				
PRODUCTIVE WORKS				
			295	636
TOTAL			295	636

* Figures relate to 1942-43

Irrigation Development Plan Projects (North-West India)

Cost per acre of area irrigated Rs (Col 4/5)	Accumulated interest arrears (Rs Lakhs)	Accumulated surplus revenue (Rs Lakhs)	Total sum at charge (Rs Lakhs)	Net return ^a (Rs Lakhs)	Percentage return on total capital outlay (Col 10/1)
6	7	8	9	10	11
15 58		717 61	108 58	26 20	24 27
13 12		918 05	268 72	42 96	14 90
13 74		1,635 66	377 30	69 25	18 35
22 56		934 56	200 50	26 87	13 40
22 56		934 56	200 50	26 87	13 40
14 81	8 90		12 78	0 04	0 03
14 81	8 90		12 78	0 04	0 09
22 56		934 56	200 50	26 87	13 40
14 81	8 90		12 78	0 04	0 09
22 33	8 90	934 56	213 28	26 91	13 17
46 44		20 58	295 64	27 41	
46 44		20 58	295 64	27 41	
46 44		20 58	295 64	27 41	
46 44		20 58	295 64	27 41	

Table 24: Old Irrigation Projects and Major

Projects included in the First
Five Year Plan—On com-
pletion

RAJASTHAN

Jawai Projects	3. 00	14 0
Other Irrigation Schemes	74 0	17 0
TOTAL	1,071 00	821 0

PUNJAB (1)

Bhakra Nangal	1,032 00	7,610 0
Harke	1,101 00	-
Tubewells	100 00	136 0
Other irrigation Schemes	277 00	700 0
TOTAL	12,752 00	4,446 0

PATIALA AND EAST PUNJAB STATES UNION

Irrigation Schemes	36 00	129 0
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AJMER

Irrigation Schemes	11 00	N A
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HIMACHAL PRADESH

Irrigation Schemes	80 00	100 0
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Plan TOTAL

	13,950 00	5,492 0
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* Figures relate to 1942-43

@ Excluding Harke

† Cost of Irrigation portion only

‡ In the case of this project the cost of irrigation is really somewhat less because the total expenditure excludes expenditure on penstock pipes etc necessary for the development of power at a future date.

Irrigation Development Plan Projects (North-West India)- *concl'd*

Cost per acre of area irrigated (Rs) (Col 4/5)	Accumulated interest arrears (Rs Lakhs)
6	7

702 2†	..
<u>96 3</u>	—
<u>130 1</u>	—

341 2

114 0

39 6

287 2

1 The figures represent half of the capital outlay and half of the total area irrigated by the Canal. The balance is shown under Pakistan.

27.9

...

N. A

2 The figures represent 1/3 of the total capital outlay and 1/3 of the total area irrigated by these Canals. The balance is shown under Pakistan.

80 0

254 0

Table 2(g)—Old Irrigation Projects and Major

Zone	Date of completion	Date when system first came into operation	Total capital cost (Rs. Lakhs)	Area irrigated in acres
1	2	3	4	5
Before 1891				
PRODUCTIVE WORKS				
PUNJAB (P)				
Upper Bari Doab Canal (A)	1876-79	1860-62	1 55	1 77.0
SIND				
Sukkur Canal	1885-86	1870-71	0 15	1 0
Unharwah	1890-91	1885-86	0 17	1 1
Begari Canal	1890-91	1855-56	25 56	2 0.3
Desert Canal	1891-92	1872-73	24 06	2 64.7
N W F P.				
Lower Swat Canal	1884-85	1885	57 22	1 65.4
TOTAL			<u>230 27</u>	<u>1,491 6</u>
UN-PRODUCTIVE WORKS				
PUNJAB (P)				
Indus Inundation Canals	1849-50	Prior to 1849	34 35	3 17.7
Shahpur Inundation Canals	1870-71	1870	2 26	76 2
Muzaffargarh Inundation Canals	1896	Prior to 1849	17 10	3 53.6
BALUCHISTAN				
Pishin Canals	31-3-1893	1888	29 53	4 7
SIND				
Fulch Canal	1892-93	1861-62	61 09	3 16 7
TOTAL			<u>144 36</u>	<u>1,045 9</u>
Pre 1891—TOTAL			<u>374 63</u>	<u>2,536 5</u>
1891-1900				
PRODUCTIVE WORKS				
PUNJAB (P)				
Lower Chenab Canal	1899-1900	1871/1892P	481 50	2,662 4
N.W.F.P.				
Kabul River Canal	1896-97	1893	15 27	53 5
TOTAL			<u>497 07</u>	<u>2,715 9</u>
1901-1910				
UN-PRODUCTIVE WORKS				
N W F P				
Paharpur Canal	1909-10	1907	33 25	34 4
TOTAL			<u>33 25</u>	<u>34 4</u>
1911-1920				
PRODUCTIVE WORKS				
PUNJAB (P)				
Lower Jhelum Canal	31-3-1917	1901	212 97	967 2
Upper Chenab Canal	31-3-1917	1912-13	431 25	737 2
Upper Jhelum Canal	31-3-1917	1915-16	468 29	340 2

Pakistan before partition—contd.

Cost per acre of area irrigated (Rs.) (Col. 4/5)	Accumulated interest arrears (Rs. Lakhs)	Accumulated surplus revenue (Rs Lakhs)	Total sum at charge (Rs Lakhs)	Net revenue* (Rs Lakhs)	Percentage return on total capital outlay (Direct & Indirect) (Col. 10/11)
6	7	8	9	10	11
15 58		717 61	108 58	26 29	24 22
16 00		3 66	0 48	0 10	20 02
10 53		41 09	9 37	0 72	7 63
9 47		132 08	25 56	8 32	52 53
10 89	.	46 27	29 06	4 75	16 35
34 59	.	146 24	57 22	8 81	15 40
15 44		1086 95	230 27	48 99	21 28
10 82	32 28		66 66	2 13	6 19
2 97		6 58	2 26	1 13	
4 83	..	91 18	17 10	1 08	11 57
627 70	17 37		46 90	—0 12	.
19 29	.	129 50	61 09	3 60	5 89
13 51	49 65	227 26	194 01	6 46	4 47
14 63	49 65	1314 21	424 28	55 46	14 80
18 10		5230 93	481 80	197 38	12 9"
28 54		30 81	15 27	1 50	1" 20
18 32		5261 74	497 07	199 97	40 03
96 66	28 10		61 34	—0 01	
96 66	28 10	..	61 34	—0 01	..
22 09	.	978 81	212 0"	41 12	21
58 50		115 39	471 26	12 64	12 64
137 65	333 11		821 39	17 21	17 21

Table 2 (g)—Old Irrigation Projects—

Zone	Date of completion	Date when system first came into operation	Total capital outlay (Direct & Indirect) (Ru Lacs)	Area irrigated* (000 acres)
1	2	3	4	5
Lower Bari Doab Canal	31-3-1917	1913-14	231.49	1408.0
TOTAL			2344.00	3452.6
UN-PRODUCTIVE WORKS				
N W F P				
Upper Swat Canal	1917-18	1914	210.92	254.5
BALUCHISTAN				
Nari Wari Canals	1-5-1918	1917	6.71	17.8
TOTAL			217.66	272.3
1891-1920				
PRODUCTIVE WORKS			1841.07	6168.5
UN-PRODUCTIVE WORKS			250.91	306.7
TOTAL			2091.98	6475.2
1921-1930				
PRODUCTIVE WORKS				
SIND				
Sind, Canal and Branches	1921-22	1922-23	8.67	47.6
Rajp, Chitu and Garang	1921-22	1922-23	2.76	8.0
Canals in Rohi	1921-22	1922-23	8.82	39.8
TOTAL			20.25	95.4
UN-PRODUCTIVE WORKS				
SIND				
Mahwah	1922-23	1901-03	20.54	75.3
TOTAL			20.54	75.3
1931-1940				
PRODUCTIVE WORKS				
PUNJAB (P)				
Harali Canals	30-9-1939	12-4-39	377.61	914.7
Sutlej Valley Projects (2/3)	31-3-1933	1926-27	591.27	1273.1
Thal Project				
SIND				
Unified Lloyd Barrage System	1933-34	1932-33	2463.61	2641.4
BALUCHISTAN				
Lloyd Barrage and Canals Construction (Nasrabad Section)	1933-34	1932-33	109.96	120.6
TOTAL			3572.45	4969.8
1941-1940				
PRODUCTIVE WORKS			3562.70	5065.2
UN-PRODUCTIVE WORKS			20.54	75.3
TOTAL			3583.24	5140.5

*Figure relate to 1942-43

Pakistan before partition—*contd.*

Cost per acre of area irrigated (Rs) (Col 4/5)	Accumulated interest arrears (Rs Lakhs)	Accumulated surplus revenue (Rs Lakhs)	Total sums at charge (Rs Lakhs)	Net revenue* (Rs Lakhs)	Percentage return on total capital outlay (Direct & Indirect) (Col 10/4)
6	7	8	9	10	11
16 44		1496 67	231 49	104 19	45 01
38 92	333 11	2590 90	1677 10	198 94	14 80
82 88	127 51		338 43	10 70	5 07
37 87	4 74		11 49	0 48	7 08
79 93	132 25		349 92	11 18	5 14
29 85	333 11	7852 64	2174 17	397 91	21 61
81 81	160 35		411 26	11 14	4 44
32 31	493 46	7852 64	2585 43	409 05	19 55
18'21	...	14 28	8 67	-0 68	12 35
34'30	...	9 86	2 76	0 34	5 43
32 16	...	1'01	8 82	0 48	0 69
21 23		25 15	20 25	0 14	
27'28	40'72	...	61'26	-2'51	...
27 28	40 72	...	61'26	-2 51	
40 40	"	49 55	377 61	46 56	22 23
46 44	"	41 16	391 27	58 91	9 55
93 27	800'85	"	3264 46	102 36	4'15
91 18	25 50		135 46	1'01	1 4'
71 28	826 35	90 71	4368 80	209 44	4 97
70 34	826 35	115 86	4389'85	209 51	4 98
27 28	40 72		61 26	-2'51	...
69'70	867 07	115 86	4450 31	2'00	...

Table 3—Major Irrigation
(Detailed statement)

Name of the Project	Date begun	Date of completion	Cost during the plan period (Rs. Lakhs)	Total cost (Rs. Lakhs)
1	2	3	4	5
I—NORTH INDIA				
Uttar Pradesh				
Belan and Tona Canals	1950	1955-56	183	193
Tube-wells			170	719
Other Irrigation Schemes (Ex- cluding Tube-wells to be com- pleted by 1966-67)			558	1,203
ZONE TOTAL			1,211	2,205
II—EAST INDIA				
Bihar				
Sikri (Upper Valley) Irrigation	1952-53	1957-58	53	93
Tube-wells . . . . .	..	..	518	590
Other Irrigation Schemes			402	731
TOTAL			973	1,414
Orissa				
Hirakud Dam	1948	1955-56		6,379 †
Other Irrigation Works	1949-50	1955-56	300	402
TOTAL				6,781
West Bengal				
Damodar Valley Projects	1948	1955-56		2,222 †
Mayurakshi	1946	1954-55	1,352 †	1,458 †
Sonarpur Arrah Fanch Malda Scheme	1951	1953-54	105	105
Bagmati Ghum Jauragachi		1953-54	99	99
Other Irrigation Schemes			89	187
TOTAL				4,071
Assam				
Other Irrigation Schemes				
TOTAL			200	200
ZONE TOTAL			200	200
				12,466

† Cost of irrigation only.

**Development Plan Projects
for India by Zones)**

Irrigation benefits		Power benefits (000 k w. installed)		Cost of irrigation per acre (Rs)
During the plan period (000' acres)	On completion (000' acres)	During the plan period	On completion	
6	7	8	9	10
38	38	...	...	507.8
712	740	.	...	97.16
832	1,176	...	..	109.94
<u>1,582</u>	<u>1,954</u>	<u>..</u>	<u>..</u>	<u>112.84</u>
40	60	...	...	155.0
362	434	...	..	135.9
348	358	...	.	204.2
<u>750</u>	<u>852</u>	<u>...</u>	<u>.</u>	<u>165.9</u>
261	1,785	48	123	357.4
502	502	...	.	80.1
<u>763</u>	<u>2,287</u>	<u>...</u>	<u>.</u>	<u>295.5</u>
595	1,141	194	274	111.7
600	600	4	4	213.0
46	46	..	..	225.4
26	26	...	.	110.5
333	333	.	..	161.1
<u>1,600</u>	<u>2,146</u>	<u>.</u>	<u>...</u>	<u>199.0</u>
218	218	..	.	51.7
218	218	.	.	51.7
<u>3,331</u>	<u>5,503</u>	<u>.</u>	<u>...</u>	<u>218.4</u>

Table 3—Major irrigation
(Detailed statement)

Name of the project	Date begun	Date of completion	Cost during the plan period (Rs Lakhs)	Total cost (Rs Lakhs)
1	2	3	4	5
III—SOUTH INDIA				
Madras				
Lower Bhavani	1948	1954	494	961
Malampuzha	1949	1954	302	380
Mettur Canal	1949	1954	277	245
Manimuthar	1951	1955	392	398
Bhauranuppa	1951	1955	102	102
Araniyar	1951	1955	95	95
Walyar	1951	1955	100	100
Turcabbadra	1945	1953	1,140	1,970
Other Irrigation Schemes			506	709
TOTAL			3,408	4,960
Mysore				
Bhadra Project (1st Stage)	1947	1955-56	186	2,000
Tunga Anicut	1946	1955-56	149	200
Nugu Reservoir	1947	1955-56	190	220
Other Irrigation Schemes			181	289
TOTAL			706	2,709
Tamilnadu-Cochin				
Pechi				
Chalakkudi	1948	1952-53	110	173
Neryar	1949	1952-53	98	120
Other Irrigation Schemes	1951	1954-55	120	120
TOTAL			150	197
ZONE TOTAL			478	610
IV—WEST INDIA				
Bombay				
Gandhinagar				
Godavari left bank canal	1949	1957	234	334
Mulapada left bank canal	1949	1957	445	545
Godavari right bank canal	1948	1956	401	425
Godavari Irrigation Schemes	1949	1955-56	1,151	1,216
			38	45
			2,269	2,565
	1949			
	1949	1956	43	125
			85	100
			346	577
			474**	802**
	1950	1955-56	91	91
			91	91
			2,834**	3,458**

* Cost of irrigation is really some what less, because in the expenditure figures in the First Five Year Plan Statement V. provision for power at a future date, and for the development of power at a future date, is not taken up after the plan period.

Development Plan Projects
for India by Zones)

Irrigation benefits		Power benefits (000' k. w. installed)		Cost of project per acre (Rs.)
During the plan period (000' Acres)	On completion (000' Acres)	During the plan period	On completion	
6	7	8	9	10
150	207	.	.	46; 25
30	40	.	.	950 0
40	45	.	.	544 4
15	20	.	.	1 950 0
5	8	.	.	1275 0
3	3	.	.	3,166 6
3	7	.	.	1,128 5
165	250	.	.	788 0
24	28	.	.	2,532.1
435	608	.	.	815 6
...	180	.	.	1 111 15
10	21	.	.	552 3
.	20	.	.	1,100 0
20	29	.	.	991 5
30	250	.	.	1,053 6
.	46	.	.	3-4 1
.	50	.	.	210 0
.	51	.	.	35 1
17	41	.	.	252 5
17	168	.	.	363 1
482	1,026	.	.	105 92
15	15	.	.	112 2
45	100	.	.	618 0
16	90	.	.	1-2 7
391	652	.	.	1- 5
7	6	.	.	117 5
474	893	.	.	27 2
22	22	.	.	1- 2
27	27	.	.	1- 2
59	71	.	.	1- 2
108**	120**	.	.	1- 2
33	38	.	.	1- 2
38	38	.	.	1- 2
620**	1,051**	.	.	1- 2

Table 3—Major Irrigation
(Detailed statement)

Name of the project	Date begun	Date of completion	Cost during the plan period (Rs Lakhs)	Total cost (Rs Lakhs)
1	2	3	4	5
V—CENTRAL INDIA				
Madhya Pradesh				
Dudhwa	1952-53	1956-57	113	150
Other Irrigation Schemes			195	219
TOTAL			308	369
Madhya Bharat				
Irrigation Schemes			328	339
TOTAL			328	339
Hyderabad				
Tunpabhadra	1945	1957	1,709	2,304
Rajahmunda	1947	1955	314	430
Godavari 1st Phase	1949	1955	359	441
Other Irrigation Schemes			197	251
TOTAL			2,579	3,426
ZONE TOTAL			3,215	4,134
VI—NORTH-WEST INDIA				
Rajasthan				
Jawal Project	1946	1956	203	328
Other Irrigation Schemes			301	748
TOTAL			504	1,076
Punjab (I)				
Wakra Nangal	1946	1960		12,320†
Harke	1949	1954-55	1,062	1,491
Tube-wells			110	155
Other Irrigation Schemes			216	277
TOTAL				12,753*
PLPSU				
Irrigation Schemes			34	36
TOTAL			34	36
Ajmer				
Irrigation Schemes			11	11
TOTAL			11	11
Himachal Pradesh				
Irrigation Schemes			11	11
TOTAL			80	80
ZONE TOTAL			80	80
Grand Total				13,955

Development Plan Projects
for India by Zones)

Irrigation benefits		Power benefits (000' h. w. installed)		Cost of irrigation per acre (Rs)
During the plan period (000' Acres)	On completion (000' Acres)	During the plan period	On completion	
6	7	8	9	10
40	90	.	..	166 6
74	94	...	.	233 0
114	184	.	.	201 5
83	152	..	..	223 0
83	152			223 0
100	450	..		512 0
35	79	.	.	544 3
40	53	.	.	632 1
131	149			168 1
306	731			468 6
503	1,067	.		357 4
40	46	.		713 0½
203	77			92 3
243	823			130 1
1,361	3,604	96	144	143 2
124	136	.	.	114 0
604	700	.	.	31 1
2,089	4,440			257 2
..	129			27 5
...	129			27 8
N. A.	N. A.	..	.	N. A.
N. A.	N. A.		.	N. A.
75	100	.	..	252 8
75	100	.	..	25 4
2,407	5,492	.	..	224 7

Table 4—Minor Irrigation Plan Projects in the First Five Year Plan

State	Cost of minor irrigation (Rs Lakhs)	Area irrigated (in 000 Acres)	Cost per acre of area irrigated (Rs) Col 2/3
I	2	3	4
I—North India	480	1,110	43.24
Uttar Pradesh	480	1,110	43.24
II—East India	1,174*	4,225	30.97*
Bihar	791	2,086	37.92
Orissa	N A	434	N A
West Bengal	271	933	29.05
Assam	106	770	13.77
Tripura	6	2	300.00
III—South India	1,426	763	186.89
Madras	785	556	141.19
Mysore	261	169	154.44
Travancore-Cochin	380	38	1000.00
Coorg	...	...	...
IV—West India	835	797	104.77
Bombay	684	582	117.53
Saurashtra	100	105	95.24
Kutch	51	110	46.36
V—Central India	639	524	121.95
Madhya Pradesh	396	86	460.47
Madhya Bharat	100	40	250.00
Hyderabad	23	330	6.97
Bhopal	75	59	127.12
Vindhya Pradesh	45	9	500.00
VI—North-West India	121†	857	15.63†
Rajasthan	6	193	3.11
Punjab	55	243	22.63
PEPSU	30	310	9.68
Ajmer	14	7	200.00
Delhi	12	11	109.09
Bilaspur	4	10	40.00
Himachal Pradesh	N A	83	N A
TOTAL INDIA	4,675%	8,276	60.25 %
SUPPLEMENTARY SCHEMES	3,000	3,000	100
GRAND TOTAL	7,675%	11,276	71.34 %

* Excluding Orissa

† Excluding Himachal Pradesh.

% Excluding Orissa and Himachal Pradesh both
N. A. Not available

PART B

Note on analysis of costs and results of major Irrigation projects

1. The total amount of capital outlay on all major irrigation projects of undivided India was 142 crores [This includes direct and indirect charges of construction but it is not the 'sum-at-charge' which includes interest on capital outlay, unrecouped by net revenue returns] It is reckoned, that the entire total of capital outlay attributable to irrigation within the present boundaries on India is only 81 crores

2 From this it follows that the capital outlay required for extension of irrigation worked out to Rs 54.5 only Let us refer to this sum as the 'unit cost of major irrigation development'. This is an average for all projects constructed at different periods of time. If we separate the projects by periods we find that the unit cost of major irrigation development in India increased as follows Rs 31.15 before 1891, Rs 58.6 during 1891-1920, and Rs 101.5 during 1921-40 It is interesting to compare these figures with the corresponding figures for projects in each zone, as well as for projects now in Pakistan.

TABLE I

Zones	Unit cost of major irrigation development on projects constructed					
	Before 1891		During 1891-1920		During 1921-1940	
	Rs	As	Rs	As	Rs	As
North India	33	5	61	11	71	1
East India	52	10	90	10		
South India	47	8	43	15	312	7
West India	241	15	206	3	383	2
Central India			115	2	96	4
North-West India	13	12	22	5	46	7
INDIA	Rs 31	15	58	6	101	5
PAKISTAN	Rs. 14	10	32	5	69	11

3 There are two distinct features about figures of TABLE I to which attention should be invited.

First,—There are large differences in unit cost between different parts of the country,

even in respect of projects undertaken in the same period They reflect natural differences in the availability of water, the need or absence of need for storage works, the distances over which water has to be led before use and the suitability of terrain over which water has to be taken, and so

Secondly,—The unit cost increases from each period to the next There are two possible causes for such increase The main reason is easier projects are normally taken up first Those which present difficulties of storage, higher lifts and longer leads come later Therefore, the real costs (in terms of labour and materials) necessarily increase with time The other reason is the fall in the value of money, or rise in the price of materials and labour There has been a gradual trend of this nature, operating from about the middle of the last century But the increase has, on the whole, been much smaller than the extraordinary increase which has occurred within the last decade If we took into account the unduly low level of prices during the thirties, there is no good reason to suppose that the value of money had fallen during the third period as compared with the second But yet there was a substantial increase of the unit cost Obviously this shows that the real cost (in terms of labour and materials) was increasing

4 So much for costs; now for the returns There are two kinds of returns to be considered in relation to every irrigation project—whether major or minor One is the increase in agricultural productivity consequent on the increase in irrigated area created by the project The other is the 'net revenue return', that is to say, the proceeds of the sale of water to the cultivators less the cost of maintenance and operation of the project One is dependent on the other, for the price which the cultivator can be expected to pay for water supplied to him depends on the price which he gets for increased produce attributable to irrigation Though one is thus dependent on the other, the two are not in exact proportion to one another; because the relation-

*The increase is small in North India. There is a special reason for this. During the last period, an entirely new type of project, namely, power-operated tube-well projects was developed which required less capital outlay and high costs of operation. If the cost of these works is to be compared properly with the normal type of canal or tank irrigation, the present value of revenue from the former would be added to the normal capital cost.

ship between Government and the cultivators in respect of water-supply from a public works is not quite the same as that of shopkeepers and customers. The charge for water supplied has to be related to the general framework of land revenue administration and fixed largely, though not entirely, without reference to the cost of production of water.

In the past, estimates for projects invariably provided for a most meticulous calculation of the 'net revenue return'. The anticipated increase in area to be irrigated was carefully arrived at because it was the most important element in determining the net revenue return. The further step of computing the increase of agricultural productivity from the increase in irrigated area was rarely taken.

The position is now reversed in relation to the projects of the First Five Year Plan, mainly because we are concentrating on the results in terms of new irrigation and treating the net revenue return as a subsidiary issue.

5 The trend of net revenue returns on old projects is interesting and revealing. For all projects taken as a whole, the net revenue return expressed as a percentage of the capital outlay was 6.3 per cent in India and 11.1 per cent in Pakistan. The corresponding percentages for projects divided by periods and zones, are shown in the table below.

TABLE 2

Zone	Net revenue return (as percentages of capital outlay) on projects constructed		
	Before 1891	During 1891-1920	During 1921-40
North India	13.1	2.0	3.4
East India	6.7	0.7	
South India	9.2	9.2	2.5
West India	4.2	4.2	2.8
Central India		0.8	0.9
North-West India	13.3	13.2	10.0
INDIA	11.6	5.0	3.2
PAKISTAN	14.8	19.6	5.8

Figure for the special case of power-operated projects, North India, the general trend

is one of steadily decreasing profitability. This fact is brought out in another way also by the figures of accumulated interest arrears and accumulated surplus revenue shown below:

TABLE 3

Period of construction	Accumulated interest arrears (IN CRORES)	Accumulated surplus revenue (IN CRORES)
	Rs	Rs
INDIA		
Before 1891	6.3	66.1
1891-1920	16.2	24.5
1921-1940	16.0	0.2
PAKISTAN		
Before 1891	0.5	13.1
1891-1920	4.9	78.5
1921-1940	0.9	1.2

6. The figures of the TABLES 1, 2 and 3 provide the clearest possible demonstration of the operation of what economists call the 'law of diminishing returns'. The earlier projects which are taken up first not only cost less to construct; they yield the best returns—for water is brought to virgin land with fertile soil which lay waste. The increase in productivity attributable to irrigation is very large. As time passes unirrigated cultivation is extended over large areas and virgin land with fertile soil becomes scarce. It costs more to construct the new projects because there are higher lifts and longer leads to manage before water can reach the land to be irrigated. But the increase of productivity secured at the other end is smaller, because the area to be newly irrigated consists, to an increasing extent of land which is already under unirrigated cultivation and yields crops. In fact it becomes necessary to use up a good deal of cultivated land, as the water spread of reservoirs or sites on which embankments are constructed or channels are dug. Furthermore, in many cases, the cultivator is put to expense and effort in order to adapt the land for purposes of irrigated cultivation. Instances are not wanting of major irrigation projects where the State has had not only to bear the cost of construction of the project but also to subsidise the cultivators in order to induce them to lower the level of the land to be irrigated and take other steps necessary for efficiently using the water supply made available. All this diminishes the net increase

of productivity, net profitability to the cultivator, and therefore, the net revenue returns.

7. We must have the lessons of this past experience before us in order correctly to appreciate the financial implications of the major irrigation projects of the First Five Year Plan.

There is some difficulty of comparison because we are dealing with the 'actuals' for the past, and 'estimates' only for the future. But this cannot be helped.

The total capital outlay on all major irrigation projects undertaken during a century was Rs. 81 crores. The total capital outlay during the last period 1921-40 was Rs. 35 crores. Against this must be set the estimated total cost on all major irrigation projects of the First Five Year Plan—Rs. 445 crores. This may strike as extraordinarily costly, until comparison is reduced to that of unit costs.

The estimated unit cost of development under the First Five Year Plan is Rs. 276-8. The actual unit cost for the last period 1921-40 was Rs. 101-5. The corresponding figures for zones are shown in the table below :

TABLE 4

Zones	Unit cost of major irrigation development	
	Actuals during 1921-1940	Estimate of the First Five Year Plan
	Rs. As.	Rs. As.
North India	71 1	112 14
East India		226 8
South India	312 7	806 15
West India	383 2	329 0
Central India	96 4	387 7
North-West India	46 7	254 0
INDIA	101 5	276 8

In comparing the two sets of unit costs, we should remember two factors.

First,— the difference in the present level of prices and wages and that of 1921-40

Secondly,— the trend already clearly established, that of increasing *real costs*, as the easier works are constructed earlier. It is clear that the

real occasion for surprise is not that the estimated costs are so high; but that they do not appear to be high enough and, therefore, suggest the likelihood that the actuals would turn out to be in excess of the estimates.

8. It has been mentioned already that no figures of estimated 'net revenue returns' are yet available for the major irrigation projects under the First Five Year Plan.

The past actuals, as mentioned already, show a diminishing trend from 11.7 per cent on projects constructed in the first period to 5.0 per cent on projects constructed in the second period and then to 3.2 per cent on the projects constructed in the third period.

Can we form some idea, from these figures, of the probable net revenue returns on the major irrigation projects of the First Five Year Plan? We know that the estimated unit cost is 2.7 times the actual unit cost during 1921-40. Let us assume (a) that the actuals will be equal to the estimates and, (b) that the average rate per acre of irrigation charged to the cultivator will be so fixed as to yield the same 'net revenue return' per acre as during 1921-40. Then, the 'net revenue return' will work out to about 1.2 per cent. It will be necessary to levy a charge for the use of water well in excess of three times the old level of charges, in order that the increased costs of maintenance and operation can be met and a net revenue return of the order of 3.2 per cent can be secured.

The Governments concerned are known to be considering the levy of most adequate rates, 'betterment fees' etc., with due regard to the large increase in the prices of foodgrains and other agricultural produce.

But there are obvious limits fixed partly by political considerations and partly also by strictly economic considerations which always limit the realisable revenue to a fraction of the increase of prices. For these reasons and the likelihood, already mentioned, of the actuals exceeding the present estimates of total cost of these projects, it is prudent to expect that the net revenue returns will fall short of the minimum necessary for rendering the projects self-financing.

If we can determine the 'net revenue return' after the irrigation charges are fixed and compare their present value; and determine the present

value (along with betterment fees and other non-recurring receipts and recoveries) from the capital outlay in these projects, we shall arrive at a figure which represents the 'net unremunerative outlay' involved

9 The fact that public works designed to provide irrigation will involve a significant amount of 'net unremunerative outlay' is important, for it makes the real break with the past

The development of irrigation was regulated in the past by the fact that the projects had to be profit-making or at least self-financing. It is true that un-profitable works were also constructed, but these were exceptions, governed by very strict rules. They could only be undertaken in areas liable to scarcity or famine, and even then the loss involved was to be compared with probable gain in the avoidance or reduction of expenditure on famine relief.

The possibilities of development on such a basis were getting exhausted. It is unlikely that there are any now with the possible exception of some of the most backward areas, formerly under princely rule. The State has not now got to discard the old limitation. It has to incur a 'net unremunerative outlay' over and above a self-financing outlay.

It has to do this because, there is an over-riding need for the additional productivity which the project helps to secure. The *net Unremunerative outlay* on public works is the price paid by

the nation as a whole for securing this increase of productivity. It is much the same nature as the subsidies which experience has shown to be necessary if cultivators are to be induced to construct wells or other private irrigation works. There was a time not long ago, when such works were constructed in large numbers without any assistance—or with the help only of State Loans. The possibilities of such development are now exhausted. Further development requires subsidisation on a scale sufficient to reduce the net cost to the cultivator to a point at which it would be profitable for him to incur it.

10 That a situation in which public works of irrigation have ceased to pay their way is not limited to India may be seen from the following passage from the report of the Hoover Commission in the United States of America ;

"The Congress, in setting up the irrigation system, provided that farmers should repay the costs of the system, without interest added to the cost during construction or subsequent interest on the cost. Experience has shown, however, that even with this indirect subsidy of interest, these projects on the average, do not pay out, as the capital cost is too great (with a few exceptions) for the farmers to bear. It is simply accepted that the national advantage of more farm houses and more national productivity are advantages which will offset Government losses".

APPENDIX -- VII
MATERNITY DATA AND BIRTH CONTROL

APPENDIX VII—Maternity

Part A—Maternity

Table I—Child birth and child survival

Age of mother on 1-3-51→ Economic Classification/Natural divisions		CHILD BIRTH INDICES							
		Still married mothers							45 and Over
		All Ages	Under 20	20-24	25-29	30-34	35-39	40-44	
1		2	3	4	5	6	7	8	9
GENERAL	East Madhya Pradesh	4.2	1.4	2.0	3.1	4.3	5.3	5.8	6.1
	N-W Madhya Pradesh	4.2	1.2	2.1	3.2	4.3	5.3	5.9	6.3
	S-W Madhya Pradesh	4.3	1.3	2.1	3.3	4.5	5.5	6.2	6.6
	Travancore-Cochin	4.3	1.2	1.8	2.9	4.2	5.3	6.2	6.6
RURAL	East Madhya Pradesh	4.3	1.4	2.0	3.1	4.3	5.8	5.8	6.1
	N-W Madhya Pradesh	4.2	1.3	2.1	3.1	4.3	5.2	5.8	6.2
	S-W Madhya Pradesh	4.3	1.3	2.1	3.3	4.5	5.5	6.2	6.6
	Travancore-Cochin	4.3	1.2	1.7	2.9	4.1	5.3	6.2	6.6
	West Bengal I	3.9	1.4	2.1	3.3	4.5	5.2	5.8	6.0
	West Bengal II	3.9	1.4	2.4	3.7	4.8	5.7	6.2	6.1
URBAN	East Madhya Pradesh	4.0	1.4	2.1	3.1	4.3	5.0	5.8	6.3
	N-W Madhya Pradesh	4.4	1.4	2.6	3.3	4.7	5.8	6.3	6.7
	S-W Madhya Pradesh	4.2	1.3	2.1	3.3	4.4	5.6	6.0	6.4
	Travancore-Cochin	4.2	1.2	1.9	3.0	4.2	5.4	5.9	6.4
Families of agricultural land holders and tenants	East Madhya Pradesh	3.4	1.4	2.0	3.2	4.3	5.3	5.7	6.1
	N-W Madhya Pradesh	4.2	1.3	2.0	3.1	4.3	5.2	5.8	6.2
	S-W Madhya Pradesh	4.4	1.3	2.2	3.5	4.6	5.5	6.2	6.8
	Travancore-Cochin	4.5	1.2	1.7	2.9	4.2	5.3	6.2	6.7
Families of agricultural labourers	East Madhya Pradesh	4.2	1.3	2.0	3.1	4.6	5.4	6.3	6.0
	N-W Madhya Pradesh	4.0	1.3	2.0	3.0	4.2	5.1	5.7	5.8
	S-W Madhya Pradesh	4.2	1.3	2.1	3.1	4.3	5.4	6.1	6.4
	Travancore-Cochin	4.1	1.2	1.7	2.8	4.0	5.1	6.0	6.3
Non-agricultural families	East Madhya Pradesh	4.1	1.3	2.0	3.1	4.2	5.1	5.6	6.3
	N-W Madhya Pradesh	4.3	1.5	2.4	3.3	4.6	5.7	6.3	6.7
	S-W Madhya Pradesh	4.2	1.3	2.1	3.3	4.5	5.6	6.2	6.4
	Travancore-Cochin	4.2	1.2	1.8	3.0	4.2	5.5	6.2	6.6

- Note:— (1) West Bengal I: It includes Burdwan, Bankura, Howrah, 24 Parganas, Malda and Dinajpur.
West Bengal II: It includes Burdwan, Nadia, Murshidabad and Jalpaiguri.
(2) Age-grouping of West Bengal II is: Under 25, 25-29, 30-34, 35-39, 40-44, 45 and over.

data and Birth Control

Statistics

in parts of India (1951 Census data)

CHILD SURVIVAL INDICES

Widowed or divorced mothers		Still married mothers								Widowed or divorced mothers	
All Ages	45 and over	All Ages	Under 20	20-24	25-29	30-34	35-39	40-44	45 and over	All Ages	45 and over
10	11	12	13	14	15	16	17	18	19	20	21
53	57	26	10	13	20	28	33	36	36	30	32
53	57	25	10	13	20	26	32	34	36	28	29
54	58	25	09	14	20	27	33	36	36	26	27
49	55	3.2	1.0	1.4	2.3	3.2	4.0	4.6	4.6	3.1	3.5
54	57	27	09	13	20	28	33	36	36	31	32
53	57	25	09	13	19	26	31	34	35	28	29
55	59	25	09	14	20	27	32	35	35	26	28
49	55	3.2	1.0	1.4	2.3	3.2	4.0	4.6	4.6	3.2	3.5
		2.7	1.0	1.6	2.3	3.3	3.7	3.9	3.9	..	..
		2.6	1.9	1.8	2.6	3.2	3.8	3.9	3.6	..	..
50	55	25	11	15	20	28	32	36	36	26	28
52	55	2.6	1.1	1.4	2.2	2.9	3.5	3.8	2.6	3.7	2.7
51	55	2.7	0.9	1.5	2.2	2.9	3.4	3.8	3.6	2.6	2.7
48	53	3.1	1.0	1.5	2.4	3.2	4.0	4.3	4.4	3.4	3.3
54	57	27	10	14	20	28	33	36	36	31	32
53	57	25	09	13	19	26	32	34	36	29	30
53	57	26	09	15	2.1	2.8	3.3	3.6	3.6	2.6	2.7
49	54	3.4	1.0	1.4	2.4	3.4	3.4	4.2	4.8	3.3	3.5
53	58	26	09	13	20	29	34	40	35	3.1	3.4
52	55	23	09	13	18	25	29	32	32	2.7	2.6
55	60	24	09	13	18	25	31	3.4	3.4	2.7	2.8
49	55	2.9	0.9	1.3	2.1	2.9	3.7	4.2	4.1	3.0	3.3
52	56	25	09	14	20	27	32	34	37	2.7	2.9
54	57	25	11	14	21	27	34	36	36	2.7	2.8
52	56	26	09	14	22	28	34	37	36	2.6	2.7
49	55	3.1	1.0	1.5	2.3	3.2	4.1	4.5	4.5	3.1	3.5

Table 2—Number per 1,000 births, by order and age of mother

Territories	Number per 1,000 births by order of birth					Number per 1,000 births by age of mother					
	First order births	Second order births	Third order births	Fourth, second and third order births	Births of fourth and higher order	10-14	15-24	25-34	35-44	45 and over	
I	2	3	4	5	6	7	8	9	10	11	
INDIA:											
27 districts of South India (Madras and Coorg)	228	215	181	624	376	1	438	427	124	10	
7 districts of West India (Bombay, Saurashtra and Kutch)	209	180	167	536	444	2	391	446	150	11	
24 districts of Central India, (Madhya Pradesh, Madhya Bharat and Vindhya Pradesh)	270	189	162	561	439	4	436	415	133	12	
5 districts of North-West India (Punjab and Rajasthan)	231	205	151	588	412	12	412	432	137	7	
Thirty Municipal Towns	209	196	167	572	428	6	417	441	131	5	
U.S.A.	395	284	143	822	178	..	409	477	113	1	
U.K.	423	300	137	860	140	.	254	557	186	3	

Note.—This table has been compiled from the results of the Experimental Census of Births and Deaths, 1952. Data compiled earlier by SHRI S. P. JAIN for this study in birth order statistics of India are also shown for purposes of comparison.

Table 3—Number of children born after completion of childbearing age—Great Britain

Year of marriage	Average number of live births (to marriages of completed fertility)		Percentage of marriages		
	All marriages	All except child- less marriage	With 4 or more children	With one, two or three children	Which were childless
1	2	3	4	5	6
1860 (about)	5.7	6.3	72	19	9
1900-1909	3.6	4.0	41	49	10
1910	3.1	3.5	35	53	12
1915	2.6	3.0	26	60	14
1920	2.6	3.0	25	61	14
1925	2.2	2.7	19	65	16
1927-1931	2.4	2.7	21	67	12
1932-1936	2.1	2.4	15	71	14

NOTE.—This table has been compiled from data set out in Tables XV and XVII at pages 25 and 26 of Report of Royal Commission on Population (Vol. 1) and Table 11 at page 108 of Reports and selected papers of the Statistics Committee (Vol. II, Papers of the Royal Commission) and Table X 3@ in the Census, 1951—one per cent Sample Tables, Part II, of Great Britain.

Table 4—Distribution of family size for cohorts of completed fertility, standardised for age at marriage for women marrying at under 45 years of age—Great Britain
(CORRECTED FOR UNDERSTATEMENT OF CHILDLESSNESS)

<i>Marriages per 1,000 with following numbers of live births (Census data)</i>					
<i>Total number of live births</i>	<i>Year of first marriage</i>				
	<i>1900-09</i>	<i>1910</i>	<i>1915</i>	<i>1920</i>	<i>1925</i>
0	113	121	150	142	166
1	148	170	212	218	251
2	187	205	234	236	251
3	156	171	159	161	142
4	120	111	95	95	77
5	84	74	59	55	46
6	62	53	35	34	28
7	45	34	21	23	18
8	31	24	14	15	10
9	22	15	9	8	6
10	15	10	6	6	4
11	8	6	3	3	1
12	5	4	2	2	"
13	2	1	1	1	"
14 and over	2	1		1	"
TOTAL	1,000	1,000	1,000	1,000	1,000

Table 5—Number per 1,000 births by order of birth in various countries of the world

Country/Year	First order births	Second order births	Third order births	First, second and third order births	Births of fourth and higher order
1	2	3	4	5	6
NORTH AMERICA					
Canada					
1936	253	191	135	579	421
1937	266	198	135	599	401
1938	282	206	134	622	378
1939	302	210	134	646	354
1940	317	218	135	670	330
1941	342	216	132	690	310
1942	344	227	131	702	298
1943	338	233	139	710	290
1944	317	237	146	700	300
1945	308	238	150	696	304
1946	327	244	148	719	281
1947	345	244	146	735	265
1948	313	255	155	723	277
U. S. A.					
1936	357	230	134	721	279
1937	370	233	133	736	264
1938	377	239	132	748	252
1939	375	245	135	755	245
1940	372	253	137	762	238
1941	391	250	135	776	224
1942	412	253	130	795	205
1943	373	272	143	788	212
1944	345	270	155	770	230
1945	341	269	156	766	234
1946	382	275	142	799	201
1947	416	267	138	821	179
1948	373	290	150	813	187
1949	341	301	160	802	198
Virgin Islands					
1940	245	213	140	598	402
SOUTH AMERICA					
Chile					
1940	297	192	142	631	369
ASIA					
Israel					
1949	412	308	147	867	135
1950	331	319	161	811	150

Table 5—Number per 1,000 births by order of birth in various countries of the world—*contd*

Country/Year	First order births	Second order births	Third order births	First, second and third order births	Births of fourth and higher order
1	2	3	4	5	6
Japan					
1947	286	223	152	641	359
1948	322	194	146	662	338
OTHER AREAS					
Cyprus					
1948	258	215	171	644	356
1949	227	245	178	650	350
1950	235	228	181	644	356
EUROPE					
Belgium					
1941	332	237	153		
1945	386	265	145	762	238
1946	448	256	128	796	204
1947	448	226	130	832	168
1948	431	246	130	804	196
1949				807	193
1950	417	253	137	807	193
	399	264	145	806	194
Denmark					
1936	364				
1937	371	247	146		
1938	366	253	142	757	243
1939	365	262	146	766	234
1940	377	265	150	774	226
		268	147	780	220
1941	375			792	208
1942	364	262	150		
1943	365	278	155	787	213
1944	358	281	157	797	203
1945	357	283	163	803	197
		284	163	804	196
1946	325			804	
1947	322	305	175		
1948	319	297	177	805	195
1949	319	295	179	796	204
1950	323	297	179	793	207
		296	178	795	205
				797	203
Finland					
1939	357				
1940	354	224	138		
1941	327	220	141	719	281
1942	344	246	150	715	285
1943	324	224	152	723	277
		234	156	720	280
1944	364			714	286
1945	386	228	146		
1946	414	242	142	738	262
1947	383	234	137	770	230
1948	348	260	141	785	215
1949	322	273	154	784	216
		267	169	775	225
				758	242

Table 5—Number per 1,000 births by order of birth in various countries of the world—*contd.*

Country/Year		First order births	Second order births	Third order births	First, second and third order births	Births of fourth and higher order
1		2	3	4	5	6
France						
1936		328	258	158	744	256
1938		327	257	159	743	257
1939		327	254	158	739	261
1940		289	237	165	691	309
1941		278	251	169	698	302
1942		317	244	139	720	280
1943		346	242	150	738	262
1944		324	260	156	740	260
1945		321	267	158	746	254
1946		388	267	149	804	196
1947		430	242	140	812	188
1948		387	273	147	807	193
1949		344	297	162	803	197
Germany						
1937		369	277	152	798	202
West Berlin						
1950		541	280	104	925	75
1951		553	276	102	931	69
Federal Republic						
1948		452	280	132	864	136
1949		447	291	135	873	127
1950		443	294	139	876	124
Hungary						
1937		332	217	146	695	305
Italy						
1936		253	208	157	618	382
Luxembourg						
1947		453	248	138	839	161
Netherlands						
1937		293	218	145	656	344
1938		302	222	146	670	330
1939		300	229	149	678	322
1940		315	224	145	684	316
1941		319	225	148	692	308
1942		300	235	153	688	312
1943		312	236	156	704	296
1946		271	265	179	715	235
1947		309	220	172	701	299
1948		284	239	163	686	314

Table 5—Number per 1,000 births by order of birth in various countries of the world—*cond.*

Country/Year	First order births	Second order births	Third order births	First, second and third order births	Births of fourth and higher order
1	2	3	4	5	6
1949	289	244	160	693	307
1950	284	244	166	694	306
Norway					
1926	383	232	136	751	249
1937	402	240	134	776	224
1938	418	246	135	799	201
1939	422	252	132	806	194
1940	432	250	133	815	185
1941	443	242	129	814	186
1942	428	255	132	815	175
1943	419	280	138	837	163
1944	392	303	148	843	157
1945	371	303	163	837	163
1946	337	324	164	825	175
1947	371	266	167	834	166
1948	374	287	169	830	170
1949	376	293	162	831	169
1950	375	294	165	834	166
Portugal					
1947	276	205	153	634	366
1948	268	208	155	631	369
1949	275	208	156	639	361
Switzerland					
1937	375	251	147	773	227
1941	385	256	147	788	212
1945	362	276	167	805	195
1946	360	276	168	804	196
1947	368	268	164	800	200
1948	373	267	163	803	197
1949	369	270	165	804	196
1950	366	272	165	803	197
England and Wales					
1939	419	259	130	808	192
1940	432	250	131	813	187
1941	445	237	131	813	187
1942	455	252	125	832	168
1943	448	271	125	844	156
1945	400	297	144	841	159
1946	422	299	138	859	141
1947	445	295	133	873	127
1948	415	300	141	865	135
1949	400	320	146	866	134
1950	383	319	153	857	143

Table 5—Number per 1,000 births by order of birth in various countries of the world—*cond.*

Country/Year	First order births	Second order births	Third order births	First, second and third order births	Births of fourth and higher order
1	2	3	4	5	6
Scotland					
1945	370	254	143	777	223
1946	395	265	144	804	196
1947	415	261	141	817	183
1948	386	283	145	814	186
1949	377	286	149	812	188
1950	364	288	157	809	191
OCEANIA					
Australia					
1936	373	243	144	760	240
1937	379	248	143	770	230
1938	386	258	143	787	213
1939	391	263	142	796	204
1940	395	270	141	806	194
1941	404	268	142	814	186
1942	403	268	145	816	184
1943	410	263	147	825	175
1944	367	288	159	814	186
1945	368	286	165	819	181
1946	378	288	160	826	174
1947	399	281	157	837	163
New Zealand					
1936	380	252	148	780	220
1938	409	258	143	810	190
1939	414	268	143	825	175
1940	418	275	144	837	163
1941	403	283	155	841	159
1943	324	274	195	793	207
1945	324	258	194	776	224
1948	361	289	165	815	185
1949	338	310	172	820	180
1950	324	305	184	813	187
Hawaii					
1940	313	225	142	680	320

NOTE 1.—This table has been compiled from Table 12—Birth rates by order of births—in the Demographic Year Book 1952 of the United Nations

PART B

A note on "Maternity and Child Welfare Services"—by Dr. T. Lakshminarayana, M.B.B.S., B.S. Sc. D.P.H. (Lond.) Adviser, Health Programmes, Planning Commission.

1. Objects

To provide this essential service in the most economic way utilising the services of local practitioners of traditional midwifery usually known as '*dais*'; to make it the basis for all other health services, in particular, to effectively reach the homes of the people and to educate them in all matters relating to the health and welfare of the family and the community including instructions on family planning. The scheme is formulated for the rural areas but would apply with suitable modifications to urban areas.

2. Organisation

It may be expected that there is one woman in a village practising as a *dai*, the average population of a village being assumed as 500. The *dais* constitute the basic workers. They should be trained in simple aseptic techniques and elements of midwifery. Their work should be guided and supervised by trained staff. There should be a minimum of one midwife for 10 *dais* or for 5,000 population. Such a population will give the number of births which a midwife can possibly manage, if she is attending only to the work of conducting labour, but she would be invested with the duty of supervising the work of *dais*, of home visits, of educational work and of conducting the work at the Child Welfare Centre. Normally there should be a public health nurse or a health visitor for four midwives or for 20,000 population, but until such time that more qualified hands are available, one health visitor may be expected to supervise the work of eight midwives. The health visitors will guide and supervise the work of midwives and *dais* and conduct clinics by rotation in centres where midwives are located. At the top of the whole structure there should be medical personnel to render medical care and guide and supervise the work of the rest of the staff. Though it would be desirable to have a woman medical officer at the head of each tahsil or some such administrative division, in view of the non-availability of sufficient number of women doctors it is proposed that two women doctors may be employed at the head of the organisation for a district. They should constantly tour, guide and develop the work. It is also necessary to have at the headquarters of each state, as part

of the Directorate of Health Services, a woman medical officer in-charge of the organisation of the whole State.

At centres where midwives and health visitors are located, voluntary effort should be stimulated to provide Maternity and Child Welfare Centres with a certain number of beds—maternity homes. These will serve to hold clinics and to attend to normal deliveries under clean conditions. The doctors of the organisation and others attached to hospitals or in practice should help in giving medical aid.

3. Estimate of cost per centre¹

The estimate is given in terms of a unit of 5,000 population with a Maternity and Child Welfare Centre. It shows that when a Centre is in full operation a sum of Rs 2,500 will be required. The estimate of initial non-recurring expenditure is Rs 700 towards equipment and vehicles. The details for the recurring expenditure are as follows:

Estimate of normal recurring cost		Per annum
10 <i>dais</i> at the rate of Rs 50 per annum		Rs. 500
1 midwife at the rate of Rs 60 per mensem		Rs 720
Contribution for one public health nurse or health visitor to be in charge of 8 units at the rate of Rs 125		Rs. 188
Contribution for two doctors to be in charge of 200 units at the rate of Rs 350 per mensem		Rs 42
Contingencies (including maintenance of vehicles, etc.)		Rs 50
Replacement of equipment, etc.		Rs 100
Travelling allowances		Rs. 100
Rent for building @ Rs 5 per mensem		Rs 60
Towards the staff of district headquarters and towards rent for the district headquarters building		Rs 40
Nutritional supplements		Rs. 200
For Family Planning Services		Rs 500
TOTAL		Rs 2,500

Estimate of Non-recurring cost		
Towards 2 vehicles to be maintained in district headquarters office		Rs 200
Towards equipment		Rs 500
TOTAL		Rs. 700

A bonus of Rs 50 per *dar* and the pay, etc., of a midwife are provided. Allowance has been made in the estimate for the supervisory staff common to a number of units like the health visitor and the doctors at the district level. It is assumed that normal supervisors at the State level would be available and no special provision is considered necessary. Provision has also been made for replacement of equipment, the proportional expenditure on maintenance of vehicles,

etc. It is considered necessary to provide at least Rs 200 towards nutritional supplements in addition to local effort. As a subsidy for family planning services a sum of Rs 500 is provided. It is unlikely that the full expenditure on the complete programme would be required in the early stages, so that sufficient margin of allotment would be available to cover the initial capital expenditure.

PART C

Extracts from the Report of Royal Commission on Population 1949 and Statistical Data.

(i) Report of the Royal Commission on Population.

[Chapter 3]

[59] We have a good deal of information about the size of Victorian families, the main source being the Fertility Census of 1911, an inquiry associated with the General Census of that year in which married couples were asked to state their date of marriage and the number of children that had been born to them. From the information so obtained it can be estimated that the average number of children per completed family was in mid-Victorian times between 5½ and 6, and this figure agrees with other calculations based on the numbers of births registered at that time. The Census also threw light on the early stages of the fall in average family size, which by 1911 was well under way. The figures are summarised in TABLE XV.

TABLE XV

Average size of completed family of women born in each five year period, 1845-1865, and recorded as married women in 1911 (Fertility Census, England and Wales, 1911)

Period of birth of women	Average number of live births	Reduction in average size of family compared with previous group
1845-49	5.71	
1850-54	5.63	.08
1855-59	5.45	.23
1860-64	5.05	.40
1865-69	4.66	.42

Over the period covered by this table (most of the births entering into its figures must have occurred during the years from 1865 to 1900) the average size of family fell by a quarter. The fall began slowly and gathered speed as time went on, as the last column of the table shows. The second group of women differed only slightly from the first in average family size, the difference between the last two groups was five times as great. By the end of the period covered by the table the decline was proceeding rapidly.....

[61.] We cannot, unfortunately, continue the series of figures given in TABLE XV, but the Family Census of 1946 provides information about the subsequent trend of family size on a different basis, namely the date at which the marriages took place. The figures are given in TABLE XVI.

TABLE XVI

Estimated average size of completed family of women married 1900-29 (based on Family Census of Great Britain, 1946, provisional figures).

Period of Marriage	Average number of live births
1900-9	3.37
1910-14	2.90
1915-19	2.55
1920-24	2.38
1925-29	2.19

The figures present a picture of rapid decline. Even among the earliest group of married couples, those married in 1900-09, the average number of children born was two less than in mid-Victorian families: a further decline, amounting on average to a reduction of over one child per family, took place between this group and the couples married in 1925-29. The families of this latter group of couples, averaging 2.7 children each, represent a reduction of 60 per cent. on the mid-Victorian average of 5½ to 6.

[62.] These two averages bring out strongly the great extent of the change, but they tell us nothing about the distribution of married couples over different sizes of family. For this purpose we give the figures shown in TABLE XVII, taking the record of the couples married in 1925 as representative of modern habits of "family building".

TABLE XVII

Changes in distribution of families by size.

Number of children born	Marriages taking place about		Per cent	Per cent
	1860 (based on 1911 Fertility Census of England and Wales)	Marriages of 1925 (Great Britain, 1946 Family Census)		
0	.	.	9	17
1	.	.	5	25
2	.	.	6	25
3	.	.	8	14
4	.	.	9	8
5	.	.	10	5
6	.	.	10	3
7	.	.	10	2
8	.	.	9	1
9	.	.	8	0.6
10	.	.	6	0.4
Over 10	.	.	10	0.3

[70.] . . . Among couples married in the first three decades of this century, the average size of family of the manual workers has exceeded that of the non-manual workers by a large and consistent margin, amounting to just over 40 per cent. of the average non-manual workers' family. The stability of the difference is striking. Among non-manual workers married since 1920 the average number of children born per married couple has fallen well below two, while the manual workers have come down to an average of about 2½ each.

TABLE XXI

Estimated average size of completed family, manual and non-manual workers, according to period of marriage (based on Family Census of Great Britain, 1946 provisional figures).

Date of Marriage	Non-Manual Workers	Manual Workers	Ratio of (3) to (2) (percentage)
1900-09	2.79	3.94	141
1910-14	2.34	3.35	143
1915-19	2.05	2.91	142
1920-24	1.89	2.73	144
1925-29	1.73	2.49	144

[72.] There is some evidence—though the statistical information on the subject is scanty—that the trend of family size has differed between people of different religious affiliation. The decline has been slower among Roman Catholics than among Protestants. But the extent of the difference can easily be overstated, there is little doubt that average family size has declined greatly even among the Roman Catholics. Moreover, Roman Catholics of different occupational groups seem to differ in average family size in very much the same way as do non-Catholics

[Chapter 4]

[74.] The fall in the size of the family over the last seventy years, which was described in the previous chapter, is the salient fact in the

modern history of population in Great Britain. In examining its causes we have first to distinguish between two distinct kinds of influence, and to measure, so far as possible, the importance of each. These are, on the one hand, the extension of deliberate family limitation, and on the other any changes which may have taken place in what we may conveniently call "reproductive capacity"¹, in brief, the distinction between voluntary and involuntary factors. In this task we have been greatly aided by the work of the Biological and Medical Committee, and this Chapter is little more than a summary and paraphrase of their report on Reproductive Capacity².

Conclusion :

[87] There is thus an overwhelming volume of evidence in this and other countries that the rates of childbearing are at present being greatly restricted by the practice of birth control and other methods of deliberate family limitation below the level at which they would stand if no such methods were practised. That this level is itself as high as it was before 1880 cannot be stated dogmatically. It is just possible that there has been some decline in reproductive capacity, though there is no positive evidence to this effect; indeed, so far as we know, reproductive capacity may well have risen. If there has been any decline, it is extremely unlikely that it has been sufficient to account for more than a small part of the fall in average family size. Of this fall, the spread of deliberate family limitation has certainly been the main cause, and very probably the only cause. Finally, there can be no doubt that if the married couples of today wished to have much larger families than they now have, they would be able to do so; no biological or physiological factor would prevent them

.....

[Chapter 8]

[192.] It is true that coitus interruptus is very widely practised and the available evidence does suggest that it is somewhat less effective as a

¹ We include under "reproductive capacity" all the conditions contributing to the number of children born to a group of married couples among whom deliberate family limitation is not practised. It is thus affected by changes in the opportunity and desire for sexual intercourse, and by the rate of "reproductive wastage" from spontaneous abortion (and stillbirth, as well as by the physiological factors which determine the ease with which conception is brought about.

² Papers of the Royal Commission on Population.

method of contraception than "appliance" methods. On both these points the Fertility Inquiry of the Royal College of Obstetricians and Gynaecologists gives definite evidence. Thus among a group of couples married in 1935-39, all of whom had practised some form of birth control between marriage and 1946, as many as 44 per cent had never employed any kind of appliance contraceptive; and pregnancy rates during the practice of "non-appliance" birth control were found to be about one-fifth higher than under appliance methods. In discussion about the future of the birth rate it has often been taken for granted that the practice of non-appliance methods reflects an ignorance of the existence of more effective methods or a prejudice against them of a kind which can be expected to be fairly rapidly dissipated with rising standards of education, the spread of knowledge and the normal processes of social imitation. It is easy to push this line of thought too far. Among the young married couples of today, or at least among the male partners, ignorance of the existence of "appliance" methods of birth control is now rare. A dislike of these methods is by no means always founded on mere prejudice; many couples try them and give them up. Thus in follow-up work at a New York birth control clinic it was found that over a period of 18 months from receiving advice at the clinic, more than half of the couples advised had abandoned the clinic contraceptives, and in many cases had returned to coitus interruptus³. It must not be assumed that in the present state of birth control technique there may not be a considerable number of people who positively prefer non-appliance methods. Nor must it be assumed that non-appliance methods, even though they may be less efficient in reducing the rate of conception per unit of time, are necessarily less effective in the final limitation of the family. The evidence provided by the Fertility Inquiry of the Royal College of Obstetricians and Gynaecologists, so far as it goes, does not suggest that couples who practise non-appliance methods have larger families than those who use appliance contraceptives, nor that a larger proportion of them have unwanted children.

[193.] Finally, even where coitus interruptus is so practised as to yield a large number of more or less unwanted children, the result may

³ SIXT and NOTESTEIN, *Controlled Fertility*, 1940

will be due less to inherent inefficiency than to the lesser degree of care with which it is practised. Human failings, such as irresponsibility, carelessness or even drunkenness may be the causes of the unsuccessful practice of *coitus interruptus*; and these are caused which also make the practice of other birth control methods unsuccessful. Nor are they automatically eliminated by rising standards of education, social imitation and so on. During the interwar period knowledge about birth control was spreading rapidly. The proportions of married couples who employed "appliance" methods was rising continuously; the evidence of the Fertility Inquiry of the Royal College of Obstetricians and Gynaecologists leaves no doubt on this point. On the other hand it gives no support to the belief that the proportion of unwanted births was thereby reduced.

(ii) Papers of the Royal Commission on population Volume I—Family Limitation and its influence on human fertility during the past fifty years.

.... The argument in favour of such an investigation was expressed by the Biological and Medical Committee of the Commission as follows :

"It is essential that we should be able to give authoritative answers to certain questions bearing on what may be called the mechanics of family limitation. The chief of these questions are the following :

- (1) How extensively is birth control practised ?
- (2) In what proportions are the different methods of birth control practised ?
- (3) Are there important differences between different social groups in the extent of the practice of birth control, or in the choice of method ?
- (4) To what extent is birth control, as practised, effective ?
- (5) What is the extent of involuntary infertility ?
- (6) Does the practice of birth control affect to the power to reproduce ?
- (7) How important is abortion as a method of birth prevention ?
- (8) What is the proportion of 'unplanned' pregnancies ?
- (9) What is the proportion of 'unwanted' children ?
- (10) What are the chief reasons given for using birth control ?

At present no data exist which would enable trustworthy answers to be given to these questions

How extensively is birth control practised ?

The percentage of women reporting the use of any form of birth control, classified according to date of marriage, is shown in TABLE 2.

TABLE 2
Percentage of women using birth control at some time during married life.

Date of marriage	No of women	Percentage who used birth control
Before 1910	161	15
1910-19	361	40
1920-24	342	58
1925-29	339	61
1930-34	440	63
1935-39	617	66
1940-47	974	55
Omitted	47	...
TOTAL	3,281	

This table shows that there is a steady increase with date of marriage in the use of birth control at some time during married life. It should be noted that these percentages underestimate the percentage of women who will eventually use birth control in the later marriage cohorts*, since some of those not using it up to the time of the survey will subsequently adopt it. This accounts for the lower percentage in the last cohort.....

In what proportions are the different methods of birth control practised ?

The main contrast in method is between appliance and non-appliance methods. Non-appliance methods were taken to include *Coitus Interruptus* (C. I.) abstinence and "safe period's

*Throughout this Report, the term "marriage cohort" is used to indicate groups of women married in a given set of years.

but in fact the amount of reported use of abstinence and "safe period" was trivial, and non-appliance methods may be taken throughout to refer to *Coitus Interruptus*:

The percentage using birth control (TABLE 2) can be sub-divided into those who reported using appliance methods at some time during their married life, and those who used non-appliance methods only. This sub-division is shown in TABLE 5 in which the percentage using appliance methods is also expressed as a percentage of all those using control of some kind.

TABLE 5

Percentage of women using appliance methods at some time during their married life, and percentage using non-appliance methods only

Date of marriage	Those using appliance methods		Those using non-appliance methods only as percentage of all women
	As percentage of all women	As percentage of those using control	
Before 1910	2	16	13
1910-19	9	23	31
1920-24	18	31	40
1925-29	22	36	39
1930-34	30	47	33
1935-39	37	36	29
1940-47	31	37	24

It will be seen that there has been a steady growth in the use of appliance methods (the reason for the fall-off in the last period has already been mentioned), both absolutely, and proportionately to non-appliance methods. The use of non-appliance methods reached a peak about 1920-29 and has subsequently fallen.

TABLE 6

Months of exposure with various individual appliance methods expressed as percentages of the total exposure with all appliance methods at different periods of marriage.

Method	First 5 years	Second 5 years	Third 5 years
	per cent	per cent	per cent
Sheath . . .	43	40	41
Tablet . . .	19	19	13
Caps and Combinations	18	20	23
Other methods and two or more methods used consecutively .	20	21	23
TOTAL MONTHS OF EXPOSURE WITH ALL TYPES OF APPLIANCE METHOD . . .	12,850	11,708	8,246
	*	*	*

Are there important differences between different social groups in the extent of the practice of birth control or in the choice of method?

The difference between the different classes can be examined in the same manner as that followed in the first two questions, classifying the women according to social class.

TABLE 7

Percentage of women in the different Social Classes using any form of birth control at some time during their married life.

Date of marriage	Social Class		
	I	II	III
Before 1910 . . .	26	18	4
1910-19 . . .	60	39	33
1920-24 . . .	56	60	54
1925-29 . . .	58	60	63
1930-34 . . .	64	62	63
1935-39 . . .	73	68	54
1940-47 . . .	67	53	47

For marriages before 1920 and for those after 1935 there is markedly more control in the higher social classes, but for marriages between 1920 and 1935 there is little difference between the classes. This difference in behaviour of the different cohorts appears to be a genuine one, and may reflect the relative social insecurity of the manual and particularly the unskilled workers in the period between the wars.

The most striking difference in choice of method between the different social classes is between non-appliance methods. The percentages using appliance methods (of all women using some form of control) for the three social classes are as follows:

	<i>All marriage cohorts</i>	<i>Women married 1940-47</i>
	per cent.	per cent.
Class I	66	77
Class II	43	51
Class III	34	39
* *		

To what extent is birth control, as practised, effective?

TABLE II

Calculated average number of live births per woman that would be expected if no control were used by any woman, compared with the actual number of live births.

<i>Date of marriage</i>	<i>Expected number of live births without control</i>	<i>Actual number of live births</i>	<i>Deficiency</i>
Before 1910 . . .	5.1	4.6	-0.5
1910-19	4.9	3.7	-1.2
1920-24	5.0	3.0	-2.0
1925-29	5.0	2.8	-2.2
1930-34	4.9	2.5	-2.4
1935-39	4.0	2.3	-1.7

What is the extent of involuntary infertility?

TABLE 14

Women married before 1925. Percentage with 0, 1, 2, or more children.

	No. of children				No. of women
	0	1	2	3+	
(a) Control never used	12.4	12.6	15.6	59.4	472
(b) Control used	3.0	26.3	28.7	52.0	368
All women	8.2	14.3	21.4	56.2	839
(a) as percentage of all women (838)	6.9	7.1	8.7	..	

As a first approximation we may take it that the childless women in the group of control users would have had one or more children if they had not used control. The percentage of completely non-ferund women will therefore lie between 6.9 per cent. and 8.2 per cent — the percentage of women without children in the whole sample. This is no greater than the percentage, 8 per cent. of childless women in marriages occurring around 1860.

What is the proportion of 'unplanned' pregnancies?

About 23 per cent. of all pregnancies of women who used control at some time during their married lives occurred as a result of failure of control. The proportions of unplanned pregnancies showed no relation to social class.

What is the proportion of 'unwanted' children?

The percentage of children that were stated to be unwanted increased from 6 per cent. in marriages before 1910 to 14 per cent. in marriages during 1930-34. The percentage of unwanted children in families using control remained fairly constant up to 1934 with values ranging from 15 to 18 per cent.

Not more than 5 per cent. of first-born children to birth controllers were unwanted by any marriage cohort since 1910. But for second, third,

fourth and higher orders the proportion unwanted has increased with time to about 15, 30 and 50 per cent. respectively. Of birth controllers who had unwanted children, about 60 per cent. of their second children and 80 or more per cent. of their third and later children were unwanted. Throughout the century, third and fourth children have been regarded as unwanted by the more well-to-do women in the sample more frequently than by the rest of the women.

There is no evidence that the appliance users were more successful in designing the size of their family than were those who relied on non-appliance methods. We find that 2.6 children were desired by women married in 1920-24, and 1.7 children by those married in 1930-34. There is some evidence, however, that women who did not adopt control desired slightly larger families than those who did.

What are the chief reasons given for using birth control?

In the earlier marriage cohorts the main reasons in order of importance are: (a) that more children could not be afforded, (b) to space pregnancies, (c) for health reasons, and (d) that parental instincts were satisfied with the children already born. Housing difficulties and uncertainty due to the war ranked high in the later marriages. No less than 32 per cent. of those using control and married between 1940 and 1946 gave housing difficulties as one of the reasons for using control.

Financial considerations are advanced as a reason for using control rather more frequently by Social Class III, while uncertainty due to the war is advanced more frequently by Social Class I. Otherwise there is little difference between the different social classes.

Summary

In the foregoing section incontestable evidence of continuous expansion in the use of birth control methods in the present century has been displayed. But this expansion has to a great extent arisen from a continuous extension in the use of appliance methods of contraception. The use of non-appliance methods reached a peak in 1920-24 since when it has steadily declined. The relative prevalence of these two main types of method varies in the three social classes at

different points of time. The rate of growth of birth control and of appliance methods, and the rate of decline in non-appliance methods also vary in the social classes and are influenced by the relative levels of each in the early years of the century. The total amount of increase in contraception in class I is less than in the other classes, but started at a higher level. An evening-up process in the knowledge and practice of birth control methods appears to have reached a culmination amongst women married in the nineteen thirties. The true measure of such effectiveness would be the difference